

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper — Second-class postage paid at Chicago, Illinois

Vol. IV No. 24

June 17, 1970

Price: \$9/year

Poor Security Leaves DP Facilities Ripe for Sabotage

By Peter F. Carr
CW Staff Writer

Leading detective agencies and security specialists believe the security precautions taken in most DP installations are vastly insufficient. Existing methods, they say, would be ineffective in repelling intruders such as dissident students, political activists attempting to emphasize a demand, or disgruntled employees seeking revenge for some real or imagined grievance.

"Security in most installations is definitely not given enough consideration, especially physical security," according to Charles F. Hemphill Jr., loss prevention consultant with the Wackenhut Corp., one of the largest private detective agencies in the U.S.

Recent events lend credence to Hemphill's opinion. In

February, 1969, students at Montreal's Sir George Williams University burned \$1.6 million worth of computer equipment. In March of this year a bomb blast ripped through the offices of an IBM data processing headquarters in New York. Last month students at Fresno State College in California destroyed the college's \$500,000 computer by hurling a Molotov cocktail through the window.

Take Precautions

Hemphill, who is presently investigating security for a Florida bank, points out that such an incident might have been prevented had the college administrators taken the precaution of locating their computer in a windowless room, or of installing bulletproof glass in the

computer room.

Such elaborate precautions may have appeared unnecessary up to now to the managers of most computer installations, Hemphill says. But with the growing unrest in the country, the increasing sophistication of saboteurs, and the potential that computers offer for easily inflicted and costly damage, major precautions are necessary for data processing managers to fully protect their computers, he says.

However, not all computer centers require the same degree of security, nor can many afford maximum security, according to George O'Neill of the Pinkerton Detective Agency. Most of the colleges and institutions are working on a limited budget, and cannot afford the

(Continued on Page 4)



Seattle center and the Space Needle, site of the 1970 DPMA International Conference and Business Exposition.

DPMA This Month

'Short Course' Back

By Thomas J. Morton
CW Midwest Bureau

PARK RIDGE, Ill. — The "short course" concept, introduced by the Data Processing Management Association at its conference in Boston in 1967 and implemented to its present effectiveness in Washington,

D.C., in 1968, will be employed again this year in Seattle when the DPMA presents its 19th annual International Data Processing Conference, June 23-26.

The "short course" concept was introduced, according to the DPMA, to provide "greater depth penetration of the subject matter." This year, in Seattle, the DPMA said, "The conference seminar 'short course' spotlight will focus on the latest concepts in technical and general management practices, with sessions especially designed to point the way to better management."

The DPMA has scheduled 10 programs on varying subjects called "series." Each "series" is broken into three seminars. The series are, the DPMA said, "Designed to cover areas of wide-ranging interest to the data processing community. Each seminar, then, deals with specific,"

(Continued on Page 2)

User Backlash Is Developing Against High Education Costs

By Phyllis Huggins
CW West Coast Bureau

LOS ANGELES — Many IBM users are delaying decisions on the use of IBM's "for-a-fee" education services as well as on the use of any other outside services since unbundling and its related higher costs.

Industry sources say IBM is below its quota for selling education services under the unbundling arrangement. But independent firms that are geared to compete with IBM in this field are also finding themselves below quota.

The reason for the slowdown seems to be continuing after-effects of the shock of unbundling to the users' budgets. Until users can more fully appraise what has happened to them under unbundling they seem to be cautious about looking to non-IBM sources or even to IBM.

\$200,000 Forecast

One major bank in California said a cost accounting of its education needs forecast a \$200,000 budget for the year. The bank hired an instructor and a training officer and set up its own operation. "We are looking into outside services such as visual aids and are trying National Data Systems training aids. We will still use IBM for advanced training courses." He also noted that the new cost of training has affected the hiring of trainees — "we are now upgrading career bankers."

Another large bank said it has always tended to

upgrade from within and train from within. "As we are Micr oriented, we have special needs. We established a training department since unbundling and are utilizing experienced people within our organization as instructors."

The biggest problem for this bank is not just education but unbundling itself. "We had bought about \$6 million worth of IBM equipment, and expected continuing services. Now we've been hit between the eyes. We still rent some equipment but the 3% reduction doesn't come anywhere near our costs."

To help offset costs the bank has replaced IBM tape units with Telex units, IBM disk drives with Marshall drives, and key punches with Univac punches. "This is not only saving us \$200,000 a year but we now have enough people around to help our customer engineering problems. IBM's service was not adequate. With this saving, we'll hopefully be able to make up some of the costs such as education," a bank spokesman said.

General Telephone Co. estimated its education costs with unbundling, and then formed a separate subsidiary of its internal training staff.

System Development Corp., one of the major training sources in the industry, teamed up with Boothe Resources International to provide an extensive selection of classes. It reported that interest in the basic classes is disappointing.

(Continued on Page 2)

WU Accused of Deficient Service To BR, Favoring Sicom Customers

By Ronald A. Frank
CW Technical News Editor

WASHINGTON, D.C. — Bunker-Ramo Corp., in a complaint filed before the Federal Communications Commission, has charged that Western Union is expanding its data processing services in violation of existing tariffs, while allowing its common carrier services to deteriorate.

The complaint charges that Western Union has favored users of its Securities Industry Communications System (Sicom) service at the expense of Bunker-Ramo's customers. Bunker-

Ramo offers several stock quotation services to firms associated with major stock market operations. These include the Teletrade, Teleticker, and Teletext services, all of which use Western Union data lines and maintenance services.

In its complaint filed with the FCC on June 5, Bunker-Ramo asks \$1,318,000 in compensatory damages and \$3,954,000 in punitive damages. The commission does not have the power to award damages, however, and an FCC spokesman told CW that this question "could only be decided by the

courts."

The FCC does have the power to regulate carriers such as Western Union and rule on violations of its tariffs. Bunker-Ramo, in the complaint, charges that WU has violated the Communications Act of 1934 by not providing equal installation and maintenance services to all its customers. This charge does fall under the FCC's jurisdiction.

In addition, Bunker-Ramo charges that WU has been expanding the Sicom service to include data processing services such as the matching of brokers'

(Continued on Page 2)

On the Inside

Cybernet Offers Batch Use of CDC 6600

— Page 23

Chance for DP Career Draws a 'Big House'

— Page 27

Business/Industry	29
Communications	22
Editorials	10
Education	27
Financial	35
Societies	25
Software/Services	23
Systems/Peripherals	15

The California Elections: a DP Manager's Nightmare

By Phyllis Huggins
CW West Coast Bureau

LOS ANGELES — The California elections could be called a data processing manager's nightmare. Assemblyman Paul Priolo (R-Los Angeles), chairman of the State Elections and Reapportionment Committee, said his committee will investigate slow vote counts and irregularities in Fresno, Los Angeles, Orange, and San Diego counties. All of them used computers.

He said that an initial investigation showed that in no case was it the fault of the computers but

of the clerks or registrars in charge. His committee's investigation will be the third by that group in two years in Los Angeles alone.

The Los Angeles County Board of Supervisors is also appointing a blue ribbon committee to investigate the problem. This will be the second such committee for Los Angeles in one year.

The other counties in the controversy are calling for local investigations of their vote counts.

Whether anyone will ever know what the true vote count in Los Angeles was is considerably in doubt due to lost ballots and incorrectly printed ballot guides.

Bad for Image

What is sure is that some heads are going to roll. Computers have suffered a real setback in the public image, and lawsuits of varying types are going to tie up official results in at least Los Angeles County for some indefinite period of time.

Adding to the problems previously reported [CW, June 10], some computer tapes were prepared incorrectly in Los Angeles, and the registrar's office has to locate the precinct ballots and reconstruct the tapes. Finding the right ballots to do this could take days.

Ballots from 10 or 11 precincts are still lost. In the last Los Angeles City primary, ballots from 14 precincts were lost.

A registrar's office check of all ballot books, which guide the

voter as to where to punch his hole to record a vote for his candidate, shows so far that out of 168,000 pages checked there are 200 pages of faulty candidate listing. A total of roughly 400,000 pages are involved in the Votomatic ballot guides.

It is impossible in most cases to reconstruct the vote by manual counting as not all ballot guides in a poll were incorrect. Therefore, there is no way of knowing which punched cards were prepared properly and which weren't.

Case Delayed

Beverly Hills Judge Leonard Wolf's case to prevent ballot

count of his district due to incorrect ballot listing was delayed one week to permit time to audit the books in his district and find the extent of the error factor.

In another development, supervisor Kenneth Hahn, a candidate for governor, has asked the State Supreme Court to invalidate the entire California election due to irregularities.

Late, Late, Late

One week after the election the Los Angeles County vote count was not completed, and it was not known when it would be.

Fresno County finally got its vote count started 90 hours after

the election when the program was finally debugged. The trouble was due to having one man write the program. He was the only one who knew the Easycode Language for the county's Honeywell 2200 used for the count. When it was apparent that he was running into trouble, there was no one to help him out.

Election morning the auditor-controller's office assigned a six-man team headed by a Honeywell man to start writing an entirely new program using Cobol. Whichever program got on the air first was to be the one used. The winner was the one-man Easycode program.

CAC's

Computerworld

SALES Corner

COMPUTERS

Economical

1440-8K System
With 1311 Disks

1620-20K
With 1311 III

360-50 262K
CPU & 1052

1401-4 K System
All Features

SPECIAL

1311-Model IV & II
519 w/27 Pos. M.S.
088 II Collator

ALL EQUIPMENT UNDER M/A

All Types
Punched Card
Equipment

We need:

557 1

047 w/keyboard

CALL • (404) 458-4425

Computer
Acquisitions
Company

P.O. BOX 29185
ATLANTA, GEORGIA 30399

POSTMASTER: CHANGE OF
ADDRESS FORM 3579 to be
sent to Computerworld Circulation
Dept., 797 Washington, New-
ton, Mass. 02160.

WU Carrier Service Neglect Charged

(Continued from Page 1)
buy and sell orders.

Bunker-Ramo said that since the FCC authorized WU to operate the Sicom service, the carrier has provided a steadily decreasing level of service to Bunker-Ramo customers.

Sicom is a service for the stock brokerage community that offers store and forward message-switching to brokerage houses to link their remote offices through three Univac 415 computers operated by WU in New York.

The complaint says that since early 1968 when Sicom was first approved by the FCC, "the defendant's delays in new installations for Bunker-Ramo and its

customers began to grow in duration. By February, 1970, there were 21 installations past due for more than one month. Many were two months overdue and longer. Delays for as long as seven months have been experienced."

The complaint says that "since July, 1969, Western Union has failed to complete any new installations for Bunker-Ramo or its customers on or reasonably near the defendant's scheduled target dates. It is noted by the complainant that it [WU] can offer no hope for improvement."

The complaint says that before 1968 repair service calls to Western Union by users of Bunker-Ramo quotation services were corrected "ordinarily in less than one day, usually in a matter of hours." After Sicom was initiated, WU "permitted service failures to continue first for hours, then days, then weeks," despite repeated requests for the restoration of service.

In New York, a Western Union spokesman told CW that the carrier had not yet received a complete copy of the Bunker-Ramo complaint to the FCC. He added that the company would make a statement later.

The charge that Western Union is expanding its data processing services could have far-reaching implications. The FCC recently

released its tentative ruling in the computer inquiry which specifically would prohibit common carriers from offering data processing services unless the services were provided exclusively through separate subsidiaries.

When the Sicom service was first proposed as a tariffed service by Western Union in 1967, Bunker-Ramo was among several intervenors that asked the FCC to deny the service.

At issue was the possibility of Western Union competing unfairly, by virtue of its common carrier facilities and status, with commercial companies such as Bunker-Ramo.

In a recently published book, *Computer and Telecommunications: Issues in Public Policy*, the authors, Stuart Mathison and Philip Walker, state: "Both the provision of terminals and the message-switching computer service [offered as part of Sicom] constitute competitive markets which Western Union is attempting to enter by tying the leasing of these items to the leasing of a product (communication lines sold on a basis very advantageous to the customer) over which it has economic power."

The entire issue of Sicom offering unfair competition could again be raised if the FCC agrees to consider the Bunker-Ramo complaint.

Education Services Hurt

(Continued from Page 1)

Boothe noted that special courses such as systems development and implementation, and application systems design are receiving strong interest. According to Ron Morrison, president of Boothe Resources, "We are giving free introductory courses to management people so that they can see our credentials, our roots, and qualifications. There's a 'wait and see' attitude among users of education services."

A major aerospace firm said: "Our problems are so severe under the present economic climate that education is a minor element. We have always had in-house training courses and only used IBM for special needs. We still do this. I don't think their costs are prohibitive and the quality is good. If it isn't, now that we're paying, I'll be the first to howl. But education is

the least of our problems.

At a recent meeting of the County Association of California Data Processors, the possibility of setting up cooperative training centers to serve several counties was suggested. This is being investigated as a possible solution to unbundling education costs.

However, they also are still in the process of assimilating the effects of unbundling in order to determine what steps can be taken to adjust to the impact. As one user said, "We are getting along by doing without, but in one year it will catch up with us."

DPMA to Use 'Short Course' Concept

(Continued from Page 1)
timely subjects with discussion emphasis on the series topic."

"Participants also benefit," explained Tom Waters, the DPMA exhibits manager, "with the 'short course' concept in registering. All the seminars are pre-grouped for them. They can choose the 'course' they feel will help them the most."

The series seminar programs begin on Wednesday, June 24. Each series, or topic, having three seminars, runs Wednesday afternoon, Thursday morning, and Thursday afternoon.

The seminars are approximately two and one half hours in length, the DPMA pointed out, "leaving ample time in the day for viewing the exhibits or other conference activities."

On Friday, the convention's final day, a program of "Open Selection" seminars has been scheduled. "To keep data pro-

cessing professionals abreast of timely matters," said Waters.

"This year's series," said a DPMA spokesman, "are a top-notch collection. All of the seminars will be led by people who are recognized the world-over as

leaders in their fields. With all the concern over tightened budgets and economical unrest, especially since unbundling, the series on operations management and on consulting firms should be most topical."

CW N.Y. Bureau Chief Mugged

NEW YORK — Manhattan renewed its welcome for Computerworld's New York branch last week when that office's chief, E. Drake Lundell, was jumped and beaten by three unknown males, two black and a white.

Lundell was attacked near Washington Park in Greenwich Village the evening of June 9. He was taken to St. Vincent's Hospital in the village, suffering from cuts, contusions and abrasions, plus a possible concussion.

His glasses were smashed when he was struck in the face by one of the trio.

The New York Police Department is investigating the incident, although no leads were reported. The police department has also reported no leads since the break-in and ransacking of the New York office of *Computerworld* during its first week of operation last winter.

Data communications ideas?
Talk to Tally

STC gives quick fix

When you need a quick fix on your data communications network, you're in luck if you've got Tally equipment. Tally's Seattle Test Center can diagnose about 80 percent of the faults common to a data network over the phone in about two minutes. Then your local service man gets expert instruction in making a quick fix.

There is no service charge for this unique service to Tally customers. It's as near as your phone, and available on a worldwide basis.

Details? Write or call Tally Corporation, 8301 South 180th Street, Kent, Washington 98103. Phone: (206) 251-5500.



Our 4800 bit modem. The thing that makes it so cheap is the same thing that makes it so good.

4800 bits for \$3,325.

The secret is correlative coding (using our modified duobinary technique). It gives you an error rate of 1×10^{-6} at a signal-to-noise ratio of 20 dB. It gives you quick-polling (21.5 ms request-to-send / clear-to-send cycle). It gives you automatic error detection (eliminating the need for redundant parity check bits). And it gives you a very low price tag, all at the same time.

Lenkurt invented correlative coding. That's why our 26D is the highest quality, most economical modem available for multipoint polled, C2 line operation.

For \$3,325, the 26D offers: Simplex, duplex or half-duplex operation.

Transmit line equalizer.

Receive line equalizer.

Self-contained power supply.

Built-in test facilities.

Full compatibility with EIA, CCITT and MIL interface specs.

Optional equalization indicator (\$250 extra).

Or, for \$300 less, you can get the 26D without pre-equalization, for point-to-point applications.

And when one of our 25B modems is hooked up to the 26D you have a 150 bps secondary channel (for error control or low speed data) at no additional line cost.

Here's where you get them: Atlanta (404) 261-8282 / Chicago (312) 263-1321 / Dallas (214) 363-0286 / Falls Church (703) 533-3344 / San Carlos (415) 591-8461.

Or write: Lenkurt Electric Co., Inc., Department C720, 1105 County Road, San Carlos, California 94070.

LENKURT ELECTRIC
GENERAL TELEPHONE & ELECTRONICS

Data Transmission Systems from Lenkurt

Computers 'Communicate' to Bring Mass. Tax Bonus

By Edward J. Bride

CW Staff Writer

BOSTON — A little free computer time, a little ingenuity and hard work, and the Commonwealth of Massachusetts may be richer by \$1.5 million.

That's how a spokesman for the Secretary of the Commonwealth explains the "bonanza" of financial statements and fees pouring into the secretary's Office of Corporations, one of the 10 divisions under John F.X. Davoren.

Director of the Division of Corporations is Michael A. D'Avolio, who, together with Davoren, discovered two non-communicating computers, one in the Treasury Department, the other in the Bureau of Taxation.

By making these computers "communicate," D'Avolio was able to remind some 40,000 corporations that they were delinquent in filing both annual financial statements and a required \$25 filing fee.

D'Avolio said that some of these corporations were as much as five or six years late, and that the job could never have been done manually without the aid of the computer.

Updating the "certificate of condition" file, the formal name for financial statements, is really the second part of a program to relieve the state of some of its paperwork burden.

25,000 Inactive Businesses

The first part originated by D'Avolio and Davoren was the "mass dissolution" of 10,000 inactive corporations last September.

Accomplished with the help of the State Supreme Court, another 5,000 have been dissolved since last September. He also said that his office is in the process of completing the project by dissolving another 10,000, making a total of 25,000 inactive corporations removed from the files.

The list was compiled from a master tape in the Bureau of Taxation, and a byproduct of this campaign was the collection of back taxes from some corporations which desired to remain in business.

D'Avolio said that the state had been processing about "one thousand voluntary dissolutions per year" until the procedure was computerized.

There are about 90,000 domestic corporations doing business in Massachusetts, but when he went over to the Treasurer's office, he discovered that only about half were complying with the law requiring annual filing of financial statements and the \$25 filing fee, D'Avolio continued. So, he took the tape from Taxation, compared it with the Treasurer's, and came up with a list of nearly 50,000 delinquent corporations.

Delinquent Notices Pay Off

Now, it started getting easier, the road ahead was clear. Notices were sent out to the 40,000 delinquents and as a result, D'Avolio said the Commonwealth could expect to collect \$1 million in June alone.

Additionally, the notices are

resulting in some of these business concerns paying tax arrears, "all thanks to the computers available in our sister agencies of government."

Now, the Office of Corporations plans to send out annual reminders to all businesses that their "certificates of condition" are due, similar to the Internal Revenue reminders in the form of tax booklets.

All this windfall will have relatively low overhead. The two "sister agencies" provided free computer time when it was available. The Office of Corporations was billed \$900 for overtime programming and operating when that was needed.

Stamps and paper, plus some clerical help to record the certificates of conditions, will run the total cost to about \$2,500, ac-

cording to D'Avolio.

He estimated that, if an outside firm had been contracted to investigate and collect the funds, the overhead would have run to \$50,000.

Ultimate reason behind the investigation was the question of need, availability, or compatibility of computer technology for the Office of Corporations.

D'Avolio said that he did not think his division could be compatible with both Taxation and Treasury, since they had IBM and Honeywell equipment, respectively.

But through interagency cooperation, he was nonetheless able to compile lists required to do his job better, and to assist both of the other divisions to expedite collections and discourage arrears.

Installation Security Called Inadequate

(Continued from Page 1)

type of security that they should have, or that industry could handle, he says.

Basically, protecting a computer installation is like protecting any area that contains expensive equipment, O'Neill says. "Ideally, the computer should be located in a building with fewer windows and doors. The doors should be controlled electronically, so that they could only be opened by a badge system or another suitable means of identification. In addition, an around-the-clock guard should be placed on the computer center," he says.

For maximum benefit, according to Hemphill, the guard function should be kept separate from the personnel function, since employees are usually unwilling to challenge unauthorized personnel.

Alarm System

Hemphill also advocates the use of an alarm system, such as closed circuit television, or smoke alarms. Many similar alarm systems are available from the different detective agencies. Pinkerton, for example, manufactures a space alarm that works on a radar principle, so that when an unauthorized person enters a prohibited area, an alarm is set off notifying the guard.

But generalizations cannot be made about security, according to Hemphill, and each case must be analyzed on an individual basis.

Factors to Be Considered

The factors to be considered in each circumstance include location of the computer center, the crime rate in the area, kind of access to the building and personnel protection. In many cases these factors have been ignored by managers in planning security for their facilities, he says.

But the more obvious solutions for improving security such as providing additional guards or adding electronic surveillance measures will not always provide the necessary effective security precautions, according to Robert V. Jacobson, president of Bradford Associates, of Waltham, Mass., a consulting company spe-

cializing in security for computer installations.

According to Jacobson, managers should pay more attention to smaller aspects of their installations which are frequently overlooked, and which any sophisticated saboteur could use to inflict damage on the computer.

Many buildings are vulnerable to sabotage, Jacobson says, and a saboteur can easily put a computer out of business by cutting off the power lines or the air conditioning.

Case Cited

To illustrate this point, Jacobson cites the case of an installation where the computer was on the ground floor with an air conditioning unit outside at ground level.

"To my mind, this installation was very vulnerable," he said. "This individual could be put out of business for at least a day or two with little difficulty, and could be wrecked for many weeks if firebombs were used."

"In another installation, the fresh-air intakes were at grade or ground level," he says. "Even though the computer itself was on an upstairs floor which had no windows — it was solid masonry around the outside — a saboteur could create trouble with a smoke grenade or a fire-

bomb in that fresh-air inlet."

Another feature often overlooked is the communications circuits, Jacobson says. In many places the telephone wires with their identifying tags are left unsecured.

Location Not Publicized

The location of the computer center should not be publicized in any way, he says, even to the extent of not putting the location of the computer room on the directory in the elevator lobby.

"If you have to put something there, put a person's name, or direct the visitor to another area where he may inquire from a receptionist. In no circumstances is there any reason to indicate the exact location of the computer," he says.

"Another avenue of approach that is sometimes overlooked is freight elevators," he says. "We frequently find that we can enter buildings by means of the freight elevator at a lower level, even where the building supposedly has very good security."

Jacobson is far from optimistic about the security precautions now used in most installations.

"I think that the only reason we have not had more trouble so far is that saboteurs have been unsophisticated, and have not really thought about it," he said.

New Jersey Bill Would Establish DP, Telecommunications Division

TRENTON, N.J. — A bill to establish a central data processing authority has passed both the state Senate and Assembly, and awaits only the signature of Gov. William T. Cahill before it becomes law.

Proposed by the Cahill Administration, the bill would establish a Division of Data Processing and Telecommunications, with separate subordinate bureaus for the two different technologies.

The division, under the state treasurer, would be responsible for evaluating all requests affecting the information processing facilities of the state, including the "acquisition, continuation or alteration of equipment."

Included in the division's responsibilities would be approval

for the use of consulting firms in studies or projects, and approval for any purchase of DP services.

The division would also coordinate the assignment of DP tasks among the various state government facilities and conduct "periodic effectiveness audits" of those facilities with DP capabilities.

The bill authorizes the state treasurer to spend up to \$150,000 in the year beginning July 1, to carry out its mandate.

The division would be under the immediate supervision of a director who would be "appointed by and serve at the pleasure of the state treasurer," who will also determine the director's salary.



COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

TM Reg. U.S. Pat. Off.

Executive Editor

Robert M. Patterson

News Editor

V.J. Farmer

Technical News Editor

Ronald A. Frank

Staff Writers

Edward Bride, Peter Carr, Judy Dick, Harvey Elman, Leslie Flanagan, Donald Leavitt, Christine Magnuson, Michael Merritt, Anne Nolan, Frank Piasta, Sara Werman.

Regional Bureaus

Chicago: Thomas J. Morton; Los Angeles: Phyllis Huggins; New York: E. Drake Lundell.

European Bureau

London: J.H. Bonnett

Supplements Editor

Donald Strong

Research Editor

Peter L. Briggs

Copy Editors

Marvin Aronson, Laurie Reynolds, Glen Ryan, Mary Upton

National Sales Manager: Neal Wilder. Circulation Manager: Margaret Phelan. Art Services Supervisor: Henry Filing. Assistant Publication Manager: Leete Doty. Production Supervisor: Ronald H. Sumner.

Publication Manager: W. Walter Boyd. Publisher: Patrick J. McGovern.

Editorial offices: 797 Washington St., Newton, Mass. 02160. (Tel. 617 332-5606, TWX 710-335-6635). Chicago: 25 E. Chestnut St. 60611 (Tel. 312 944-5885, TWX 910-221-1377). Los Angeles: 11661 San Vicente 90049 (Tel. 213 826-6655, TWX 910-342-7550). New York: 120 E. 34th St. 10016 (Tel. 212 532-1790, TWX 710-581-5330). Europe: Computerworld, c/o IDC Europa Ltd., 59 Grays Inn Rd., London, W.C.1., England (Tel. 01-242-8908).

Subscriptions: Address all correspondence to Circulation Department, Computerworld, 797 Washington St., Newton, Mass. 02160.

Weekly newspaper — Second-class postage paid at Chicago, Ill. Published weekly (except: a single combined issue for the last week in December and first week in January) by Computerworld, Inc., 25 E. Chestnut St., Chicago, Ill. 60611. © 1970 by Computerworld, Inc.

Reproduction of material appearing in Computerworld is strictly forbidden without written permission. Send all requests for permission to the Publication Manager.

Subscription rates: \$9 for one year, \$20 for three years. Add \$1 per year for Canada; \$4.50 per year for other foreign. Foreign air mail rates available on request.

BPA membership applied for

POSTMASTER: Send Form 3579 (change of address) to Computerworld Circulation Dept., 797 Washington St., Newton, Mass. 02160

Why pay more for Graham tape?

Because the end justifies the means.

Several years ago, we set out to build the finest tape in the computer industry.

It wasn't easy. But we did it.

We built the world's first Zero Defects tape.

We built the world's first million-pass tape — tape that exceeds one million passes on

CDC 680 certifiers, with no permanent errors.

It costs a little more to make a tape like this. But we think it's worth it.

After all, how much did it cost to gather your data? Or write your programs?

How much does your com-

puter time cost? And how much depends on successful completion of your data processing operations?

Can you afford to use any tape but Graham?

 **GRAHAM
MAGNETICS**

means to an end.



Graham, Texas 76046

WATS Phone 800-433-2701

Texas Phone 817-549-3211

ACLU Proposes U.S. Agency to Regulate Data Banks

By Drake Lundell

CW New York Bureau

NEW YORK — Opponents of public and private data banks will gain a powerful new ally if the American Civil Liberties Union (ACLU) adopts proposals put forward at its 50th anniversary biennial conference here.

The proposals debated during workshops at the ACLU meeting recently including opposition to national data banks and the establishment of a government agency to regulate data banks will become union policy if adopted by the national board of directors.

The ACLU — a bipartisan organization that has defended the civil liberties of minority groups — has already been active in the data bank fight when it sued the Army over the establishment of a data bank covering civilian political beliefs [CW, Feb. 25].

Concerning the creation of a national dossier type data bank, the union policy

committees expressed some ambivalence, with some of the workshops feeling that a national data bank, if properly controlled, might be more protective of individual liberties than the present system. If not controlled properly, it could be destructive of civil liberties, they felt.

While many of the group opposed the establishment of data banks per se, all agreed that if such systems are developed "civil liberties protection should be built in first and the data systems created next."

The ACLU delegates felt that a threat to civil liberties is "implicit" in the collection, maintenance and dissemination of governmental records about individuals and stated that "the collection and maintenance of such information must be subject to the rigorous test of whether there is a compelling governmental interest in the collection of the information in question."

The establishment of a new government

agency to regulate and license all personal data banks, whether public or private, received both support and criticism by members of the biennial conference.

Proponents of the idea recommended that the federal agency should set up local advisory bodies, independent of the operators of the banks themselves, to oversee their operation and report back to the agency.

Both supporters and opponents of the agency idea agreed that individuals should have the right of access to their files in both private or public data banks.

Each individual, one group said, "has the right to inspect any information about him in government or private banks and to correct and supplement the personal data. Administrative procedures should be provided for this purpose, supplemented by legal procedures when necessary."

Some members felt that the government and private data banks should be required

to supply individuals with annual print-outs of all the information on them contained in the files. This motion, however, was tabled.

The conference agreed that "control of data dissemination and review of data, as opposed to control of its original collection, are essential in coping with the civil liberties problems."

The group agreed that dissemination of reports on identifiable individuals should not be made by private agencies without the consent of the individual, but reached no conclusion on whether this rule should apply to the government as well.

Black ACM Member Protests Presentation By South African

By Edward Bride

CW Staff Writer

NEW YORK — A black member of the Association for Computing Machinery is protesting a planned presentation by a South African citizen at the ACM Computer Personnel Research seminar, June 21-24, at the University of Maryland.

Walter A. DeLegall, a senior staff member at the Columbia University Computer Center here, said that such papers make a "farce" out of ACM's policy of neutrality on political and social issues such as racism.

He noted that the black majority is "prevented by law from working as programmers in South Africa," and that the country's personnel research institute maintains "the subjugation of its enslaved black labor force."

The schedule for the 8th annual meeting includes a paper entitled "The Construction of a Selection Battery for Programmers Adapted to South African Conditions," by R.S. Hall.

ACM officials said the paper is simply a programmer's test developed by Hall, the computer manager of the National Institute for Personnel Research, South African Council for Scientific and Industrial Research.

Robert A. Dickmann, seminar program chairman for ACM's Special Interest Group on Computer Personnel Research (Sig-CPR), said that the program committee would not cancel Hall's presentation.

Dickmann said he shared DeLegall's "outrage" at the enslavement of millions of South African blacks.

He indicated that Hall was a computer professional, and not an official representative of the apartheid government of South Africa, and that ACM officials and the program committee "concluded then that the program would remain as planned."

DeLegall said that he would attend the seminar, and also indicated that he "might have to register some protest" there.

He said that ACM's "endorsing racist research" is a matter of "morality and ethics," and that such endorsement does not carry out the ACM code which "exhorts the professional person to... use his special knowledge and skill for the advancement of human welfare."

DeLegall also suggested that the ACM, "at some later time, [might] invite a representative of the Klu (sic) Klux Klan to discuss methods of selecting programmers."

In his reply to DeLegall, Dickmann indicated that members of Sig-CPR were sympathetic with the appeal. He urged DeLegall to "come to the conference, accept Mr. Hall as an individual, allow him the courtesy to present his paper, and then ask the questions that need to be asked."

A dirty tape can give a computer the DT's.

Dirty tape causes data dropouts. And dropouts can make a computer see things that aren't there. That costs you money. And that's enough to make anyone see red.

RCA Computer Tape helps computers read and write right.

It's a special formulation that starts cleaner. Every inch of every reel is tested and certified in the cleanest of white-room conditions. (We think statistical testing leaves too many blind spots.) And it stays cleaner, longer.

So? Fewer dropouts, more

efficient computing.

Help your computer see things as they really are. Write RCA Magnetic Products, 201 E. 50th St., New York 10022.

Our tape keeps the DT's away.

RCA Computer Tape



Honeywell just had a great idea.

Ours.

Our idea was a totally new concept in data preparation.

The KeyProcessing System.

A computer-controlled keyboard input system so efficient that keypunch and key-to-tape became instant relics.

Honeywell's idea is basically the same as ours. And that's fine with us. Because their move should convince you of something we've known all along. That we had the right idea to begin with.

And once you're convinced, we can offer you something Honeywell can't.

We can offer you a system that has been proven in more than 55 installations across the country. Completely debugged installations with an overall up-time record this year of 98.2%.

It comes down to this. We both had a great idea. One has an impressive name. Theirs. And one has an impressive history.

Ours.



Computer Machinery Corporation

FBI Cautions NCIC Users on 'Sound Police Judgment'

By Edward J. Bride
CW Staff Writer

WASHINGTON, D.C. — The Federal Bureau of Investigation (FBI) has cautioned the nationwide users of its National Crime Information Center (NCIC) to use "sound police judgment" even when the center indicates that a person or article may have been involved in a crime.

A recent NCIC newsletter cautions that receipt of a positive reply to an inquiry — a "hit" in FBI jargon — does not relieve police authorities from the responsibility of "sound police judgment... in deciding on a proper course of action."

The newsletter states that "standards and procedures... are designed to protect the integrity of the system and

the participants using the system."

The letter also states that it is the "responsibility of users to follow these established standards and procedures."

The FBI's center has been the topic of much nationwide discussion since its inception nearly 3-1/2 years ago. It has been extremely successful, and now has approximately 1.9 million records on file.

The records include wanted persons, stolen guns and automobiles, plus stolen securities, boats, and other missing articles.

"Assumed Identification"

In calling for caution by police authorities, the FBI noted that "criminal types" frequently use lost or stolen identification be-

longing to an innocent party.

"This poses a problem in the event that a wanted record is entered into NCIC under the assumed identification," the bureau noted.

The statement continued: "The innocent party could be the subject of an inquiry resulting in the wanted record response. Information at the source of the inquiry along with the personal descriptors in the NCIC record should be used for identification purposes."

The most important "eliminator" is the NCIC fingerprint classification. The newsletter said

that it is "essential, where available, to include this fingerprint classification in all wanted persons records."

The letter also included procedures "to alleviate problems existent due to the various methods of classifying fingerprints," and instructed users to follow the method discussed in the NCIC operating manual.

On-Line With Canada

An FBI official recently noted that the network is on-line with the Royal Canadian Mounted Police, Canada's equivalent to

the FBI, state police, and Secret Service all in one.

Without divulging any figures, the official stated that there have been "more than a few" Canadian fugitives located through the system.

One of the more recent occurred in April, when Clarence Blain Robinson was arrested in Arkansas.

He has been arrested for the alleged theft of television sets from an Arkansas motel, and an NCIC inquiry revealed that Robinson was a fugitive from Ontario, Canada.

Honeywell Executive Proposes Legislation To Make Personal Data a Property Right

WASHINGTON — Legislation to make personal information a property right was proposed here last week by a computer manufacturing executive as part of a broad program to safeguard the privacy of the individual.

The enormous benefits accruing to society through use of the computer carry with them some "dangerous side effects" that can and must be prevented, said Robert P. Henderson, vice-president and general manager of Honeywell's EDP Division. He also is a member of the Business Equipment Manufacturers Association (Bema) data processing policy committee.

Henderson was keynote speaker before a national symposium of the National Archives & Record Service of the General Services Administration.

He set the stage for a program to prevent "pollution of privacy" by predicting that computers and their users will cause a "pyramiding of man's knowledge and intellectual accomplishment staggering to consider."

"The computer itself does not

create any invasion of privacy," Henderson noted. "The only new element in the centuries-old threat to privacy posed by surveillance and record-keeping is the computer's fantastic efficiency."

Industry Can Do Much

The computer industry itself can do much to solve the new problems, he said in outlining the "heavy responsibility" of manufacturers. He said they can build safeguards into system design, such as limiting the persons who are allowed to enter information, classifying data, and stringent limitations — through codes — on access to the stored information.

He called on managers of computer systems to exercise "sensitive control" over the trustworthiness of operating personnel. "What goes into files is a management decision. Perhaps the question needs to be asked more frequently, 'Is this information really necessary?'"

Henderson also suggested controls to limit the input of trivial information and limit the time

personal data is stored "so that a youthful indiscretion wouldn't haunt a man's record for the rest of his life."

The speaker called for new legislation to provide a citizen with the ability to challenge in court the release of private data about him without his consent.

He added: "If he is to have any control, he must be aware that personal data is stored in a computer system, and have the right to examine it and challenge it. He must be able to know who has access to the information, and to what outside agents it might be released."

Henderson suggested that the protections of due process afforded property under present laws be extended to personal information, with criminal penalties for improper conduct in gathering, storing, or releasing personal information.

Involvement Urged

He also urged the general public to become involved in the privacy issue. "The weight of public opinion can do a great deal to influence constructive public policies, voluntary ethical codes among users of computer systems, and standards of practice among businesses, government agencies, labor unions, universities, research groups, and various other organizations."

For Lease Teletype Model 33ASR with tape perforator and reader from RCA

Available in quantity for immediate delivery — includes nationwide maintenance service. Just \$50 per month.

Call or write:
RCA Service Company
A Division of RCA
Technical Products Service
Bldg. 204-2, Camden, N.J. 08101
Phone (609) 963-8000
Ext. PY-4129

RCA

CHARTER AN EXECUTIVE AIRCRAFT FOR AS LITTLE AS 12¢ A MILE

Conference style seating for six persons. New twin engine, turbo-charged Navajo Airplanes. Fly to any location — FAST — DIRECT — all weather equipped — F.A.A. approved. Crewed by two pilots — air transport rated lavatory facilities.

FLY FROM: Beverly, Boston, Lawrence, Bedford
Boston Call: 284-2016
Beverly Call: 774-2070

Call now for brochure and information

NORTH ATLANTIC AIRWAYS

Main Office: Beverly Airport Beverly, Mass



IS YOUR D.P. PACKAGE COMPLETE?

What about your agricultural applications such as:

- * Cost Accounting
- * Budget Control
- * Cash Flow
- * Problem Solving

If you have a TWX or can get one — (that's all you need) — we offer simple one page reports in farmer language through our Time Sharing Service Department.

Write or phone:
Willard F. Hess, Gen. Mgr.
for details — something new in the EDP field.

AGRI-SHARE, NORTHWEST
Columbia Basin Irrigation Project
Home Office — Box 277
Quincy, Wash. 98848

TWX 510-770-5327 phone (509) 787-3575

Free: Time-sharing Report.

Whose rates went up and why.
Who got hurt and by how much.

C. A. Bullock, Editor
Time-Sharing Today
251 W. DeKalb Pike
King of Prussia, Pa. 19406

Send me a free copy of your special report, "The Changing Costs of Time Sharing". Thanks.

Name _____ Title _____
Company _____
Address _____
City _____ State _____ Zip _____

LABOR UNIONS, ADMINISTRATORS, INSURANCE COMPANIES, SERVICE BUREAUS

We offer a Fund Administration System for Pension, Health & Welfare, Vacation, etc., for organized labor. The system provides:

- Employer Reports
- Audit Journal
- Eligibility List
- I.D. Cards
- Self-Pay Notices
- Claims Journal
- Financial Edit
- General Ledger Listing
- Operating Statements
- Balance Sheet
- Pension History Report
- + 10 Other Reports

This system is available through a fully paid lease or purchase price of \$30,000. Configuration — 4MTU, CR/Punch, Printer, 20K, COBOL.

THE COMPUTER GENERATION, INC.
PRESIDENTIAL PARK — 3781 NORTHEAST EXPRESSWAY,
SUITE 101 ATLANTA, GEORGIA 30340 (404) 458-2371

360/20, 2401-3 FOR SALE OR LEASE

IPS has for sale or lease and immediate delivery from its own inventory a 360/20 system and one 2401-3 tape drive. The 360/20 is a C1, 8K with 2203-A1 Printer, 2501-A1 Card Reader, and 2560-A1 MFCM. Price: \$62,500. The 2401-3 90KB drive is available for \$19,000 as a 7-track unit or \$22,500 as a 9-track unit. Both items also available for 2 1/2 year lease. Please call or write for additional information. Also write for our Bulletins listing other computer equipment for sale or lease.

IPS

(201) 871-4200

INFORMATION PROCESSING SYSTEMS, INC.

467 SYLVAN AVENUE, ENGLEWOOD CLIFFS, NEW JERSEY 07632

The Devonshire...

Mini Speeds Data for 250-mph Test Car

TORRANCE, Calif. — A 250-mph linear induction motor test vehicle is now being low-speed tested with the help of a minicomputer on a 1/4-mile track near here by the Garrett Corp., under a contract from the U.S. Department of Transportation.

The goal of the testing is to develop practicality studies of a new concept in propulsion: the linear induction motor, which the Transportation Dept. says shows promise of "...replacing the wheel as the driving and breaking mechanism for high-speed ground vehicles."

The concept holds that conventional vehicles propelled by traction motors are speed-limited by rail-wheel adhesion and will not fit the futuristic requirement of



Huge 25-ton test vehicle is capable of traveling 250 mph.

induction motor (Lim), on the other hand, is theoretically capable of high speeds because thrust isn't limited by such rail-wheel contact.

In collecting data to evaluate the Lim system, the nearby Varian 620/i minicomputer accepts telemetered data from over 100 sensors into two buffers at the rate of 32,000 readings per second.

Speed Regulator

The computer actually serves as a speed regulator for the data coming in from the vehicle. The 620/i, a 16-bit word machine, is equipped with an 8K core memory, part of which is used as the two buffers.

Incoming data is filling up one buffer as the other is feeding data to a magnetic tape. Thus, when that buffer is filled, it starts feeding data to the tape while the other buffer again starts accepting incoming data from the sensors on board the vehicle.

This procedure saves test time, according to Garrett engineers, and enables them to record accumulated data on the tapes in the correct format with inter-record gaps. One reel of magnetic tape, completed, covers a 10-minute run and contains more than 20 million data words.



A minicomputer feeds data to a magnetic tape recorder after it formats test data coming into an instrumentation trailer alongside the 1/4-mile test track.

The data that is decommutated from incoming signals is formatted for the buffers into a record of eight frames of 512, 8-bit words. The use of two separate buffers allows the data to run continuously and still develop the inter-record gaps on the magnetic tape when the recordings are made.

Tapes filled with data from the 620/i are calibrated and converted to engineering terms by another program fed into the minicomputer and utilizing an additional 32K of disk storage.

The results from later data analysis will enable investigators to determine performance characteristics of the linear induction motors during the low-speed tests here.

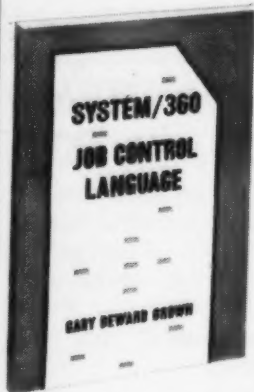
Later this year the vehicle, trailer, and equipment will be moved to a new large-scale test track near Pueblo, Colo., for high-speed testing by the Department of Transportation. The Department of Transportation says it expects vehicles of this type to be in operation in this decade, depending on the results of the upcoming high-speed tests.

NEW

from WILEY-INTERSCIENCE
The first commercially
published book on SYSTEM
/360 Job Control Language

SYSTEM/360 JOB CONTROL LANGUAGE

By Gary DeWard Brown, *The Rand Corporation*



This manual presumes no previous knowledge of System/360 JCL and is appropriate for those familiar with any computer language whether they code in COBOL, FORTRAN, PL/I, assembly language, RPG, or some other language. The manual serves as a learning text for the programmer who wants to understand and use System/360 Job Control Language, and as a reference for the experienced JCL programmer.

The brief index of Job Control Language parameters, the table of contents, and the index will quickly guide the reader to relevant portions of the text where various features of the language are clearly explained.

"Each Job Control Language feature is described in complete detail, examples are given for its use, and possible applications are discussed. Many System/360 facilities are also described in detail, with abundant examples given to show how they can be used through Job Control Language. These facilities include the linkage editor, indexed-sequential data sets, and several IBM-supplied utility programs."

—from the Preface

CONTENTS: Job Control Language Parameters. Introduction. Introduction to JCL and System/360. JCL within a Job. JCL Card Formats and Rules. Job Card Specification. Exec Card Specification. Parameters Common to Job and Exec Cards. DD Card Specification. Cataloged Procedures. DD Cards for Peripheral I/O Devices. Direct-Access Devices. Magnetic Tapes. The Linkage Editor. Miscellaneous JCL Features. Appendices. References. Index.

1970 292 pages \$7.95 paper

WILEY-INTERSCIENCE

a division of JOHN WILEY & SONS, Inc.
605 Third Avenue, New York, N.Y. 10016

In Canada: 22 Worcester Road, Rexdale, Ontario

wiley

New Phone Lines Raise Problem

PHOENIX, Ariz. — City engineer James Attebery said that there was no alternative to digging up a newly paved street in order to install telephone lines to the new American Express computer center here.

Although the telephone company had installed extra lines under the new street anticipating increased usage, there was no indication at the time that the new computer center was to be built. The Phoenix City Council last year approved zoning for the center.

City officials said that the zoning decision caught them by surprise, but admitted that there was no alternative to the American Express situation.

Attebery said that the city works closely with utilities in making plans for new operations to insure that new streets are not subsequently torn up for utility

installations.

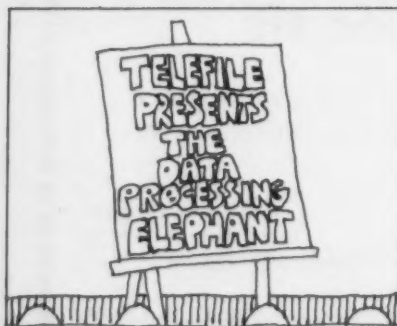
"We asked for different routings three times, but they showed us why this is the only way to get in there. The best we can do now is keep the disruption to a minimum," he said.

Mountain Bell officials said that installation of the 1.4 mile underground cable had begun, and would be finished in a few weeks.

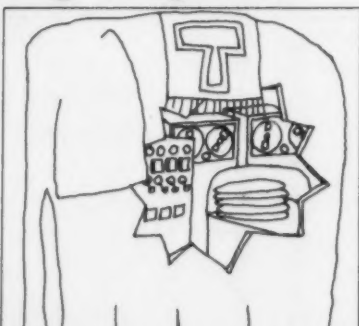
The conduit will hold a 900-pair cable needed to serve the heavy use requirements of the American Express center.

The center will have 300 telephones when it first opens for communication with customers in 20 western states, including Alaska and Hawaii, other regional offices, and its New York headquarters.

The Data Processing Elephant



The Data Processing Elephant or "DPE" is a unique computerized file management system of integrated hardware and software.



The DPE can store up to 1/2 billion characters of data. It retrieves them for you in a matter of seconds. And you don't have to go on a big game hunt to do it. Because the DPE features random access and no sorting.



The DPE understands businessmen; businessmen understand the DPE. Because the DPE uses a simple standard COBOL, the common business language, so you don't need expensive computer experts hanging around.



You don't have to be that big a company to afford the DPE. Because it's not that big an elephant. However, when bigger elephants are built, Telefile will build them.

TELEFILE COMPUTER CORPORATION, 2000 COMMONWEALTH AVENUE, NEWTON, MASS. 02186

Telefile

from Devonshire.

it'll make a name for itself

The first and only communications processor that actually cuts your computer overhead, saves you line charges, interfaces to any terminal, concentrates data, controls hundreds of lines, or just a few, and gives you remote batch and on-line operations at the same time.

Devonshire
COMPUTER CORPORATION
377 Elliot Street, Newton, Massachusetts 02164

Editorials

Supply and Demand

Only a few short months ago, there was a national shortage of programmers. Probably, within another few short months, there will be a national shortage again.

But the current unemployment situation is doing more than making life miserable for the laid-off experienced programmer. It is creating a really major future crisis.

Programmer trainees, even in normal times, have trouble getting jobs. Now, in at least some areas of the country, they can't get them at all.

A year from now, these trainees should be part of the pool of experienced programmers. But most of them won't be, because the recession will have forced them into other occupations.

So the next shortage can be expected to be much worse than the last.

This crisis could be eased somewhat if industry and government made programs available now to employ the best of these trainees. Presumably, many installations, large and small, would be willing to take in trainees if they didn't have to pay their salaries for the first six months or so.

For years, government and industry have offered cash awards to outstanding people to pursue special studies and research.

Why not provide similar grants to outstanding programmer trainees so that they could get on-the-job experiences?



'I Hear They're Going to Shoot the Programmer at Dawn.'

Letters to the Editor

A Female Tech Writer Appreciates the Cartoon

As a technical writer and a part of Women's Liberation, I would like to thank you for the cartoon which appeared April 22. Fortunately, I am paid equal wages for equal work with men, so discrimination by sex has not been a problem for me in my job.

Even though the computer business appears to be more accessible to females than other professions, it is evident that there is room for great improvement, particularly in the advancement of female programmers to higher positions such as management.

In this field, as in many others, competent women are hired on an equal basis with men only so long as there is a lack of male applicants, and these need to be especially capable, if not "super-women," in some cases, to really advance.

Although job discrimination is only one of the many ways in which women are discriminated against in this society, it is one of the most serious, since women make up 40% of the working force.

Jane E. Hart

Boston, Mass.

Disruption Has Many Forms And They Are All Negative

I enjoy and value your lively and informative newspaper, but must bring to your attention an inaccuracy or two. In the article "Implications Session Again Called 'Irrelevant,'" [CW, May 13] you report that Dr. James W. Ramey of Drexel University was a member of last spring's "Social Implications" session. Not so.

Juggling the requirements of terse summarization, thoroughness, and making a news story is admittedly difficult. But the overly terse summary characterization of Professor Dial's paper as a view on "invasion of privacy" does a disservice to the range of fundamentals he explored.

In the interest of accurate reporting in today's world, I suggest that you take a second look at the word "disruptive." In another article in the same issue: "Disruptive tactics were completely absent from the show..." In connection with the Social Implications session, I submit that it is a base disruption when a man has put his best into a paper, and men have prepared a session, to have their work characterized as "totally irrelevant." Such extreme statements are untrue in fact, discredit the witness, and show a level of disregard that the sayer would not brook in return.

When speakers from the audience essentially ignored the panel, and in effect took over the session, this too is a serious form of disruption from the viewpoint of those who labor to prepare a session. Or have you too forgotten the hundreds of hardworking volunteers who prepare and run a JCC? Because of their contribution, their viewpoint

also merits respect and consideration.

I am concerned that the chairman and two of the panelists did not show up, a level of absenteeism unheard of in a JCC session. My concern is that they may have felt intimidated about possible disruptive abuse, as occurred in Boston. I hope I'm proven wrong on this concern.

The CPP attempted a protest demonstration at one exhibit, but ultimately withdrew because of the firm and fair stand of Afips officials.

Once again, those who know only to tear down (in the name of honest dissent), and demagogues-in-the-making who hold forth in the name of some presumed higher morality, extend not the spirit of mutual respect essential to progress. They once again abused the tolerance of decent, fair people, on the stage and in the audience.

The steady negativism, the casual and brutal disregard for the very structure that gives them a forum, and the breast-beating, leavened with little that is constructive, is in itself destructive disruption. Instead of their petulantly tearing the house down, we have more than once encouraged them to function as a member of the team that *builds* the JCC house, to create a session to their liking. They turn away, scoff, sneer. Build, no; tear down, yes.

Disruption takes many forms.

H.T. Larson, Chairman
Social Implications Committee

IEEE Computer Group
Anaheim, Calif.

Cognitronics System/70

I want to register a complaint with respect to the article you printed April 29 which announced our new ROCR System /70.

Nowhere do we claim the ability to process 1,800 pages per hour. We do say we can process up to 1,800 documents per hour. To attain this throughput the document would have to contain a very small number of characters to be scanned — certainly not a full page.

Geoffrey W. Helm
Vice-President, Marketing

Cognitronics Corp.
New York, N.Y.

Computerworld welcomes comments from its readers. Preference will be given to letters of 250 words or less. Computerworld reserves the right to edit letters for purposes of clarity and brevity. Letters should be addressed to: Editor, Computerworld, 797 Washington Street, Newton, Mass. 02160.



Their System Allowed an Unnecessary Uproar, So...

Should the Professionals Responsible Be 'Decharted'?

The Cities Service Oil Co. has always struck me as having quite an unusually professional data processing staff, both by way of design and of execution of its various programs.

Take for instance, the desing of its monthly bills. Like everyone else, it wants to have machine-readable cards returned so as to ease its work. And, equally naturally, it does not produce two documents where one will do.

So it has designed it so that only a small stub has to be returned, while leaving the consumer with a full, detailed account of how all the various

usually so prompt about paying us we were wondering... etc."

A delightfully worded reminder, which was rendered particularly funny because it was the first account that they had ever sent to me — so factually it was pure nonsense!

And they even keep this maintained well also. I was a little bit late in sending out my payment this month, and along came the reminder. Not another "It's unusual" one, but an equally delightful one saying "It's 10 to 1 that you have just posted your payment — but in case you didn't... etc., etc." A magnificent piece of work, and one which had my full professional admiration — until last week.

Gas Credit to \$2,000!

Last week the Boston *Globe* broke a story about how a couple in Natick were expecting to lose their home because of troubles with this same Cities Service credit card operation that I had been quietly admiring. The story was that an unsolicited credit card had been lost or stolen, and that parts and gas had been charged by someone else.

When the bill reached \$350 odd the company had been notified, but for some reason continued to hold the couple responsible and had now ob-

Alan Taylor, consultant, writer, and former editor of *Computerworld*, is president of Computer Management Aids Corp. of Framingham, Mass.

tained a court order for \$2,100 which was to be obtained by selling the house over their heads.

There were a number of factors which tended to make things even more distressing. The man was an invalid, and had often

been unemployed since 1961. The wife was a part-time practical nurse. There were four children. The court order had been obtained while the man was in the hospital, and while he thought that an attorney had been acting for him.

And there was an immediate explosion of public sympathy

[To dechart (1970)... to deprive of computer professional status. Analogous de-frock, disbar. The reference to chart refers both to a computer flowchart, and also to the action of removing the offending professional from his position in an organization chart.]

for the couple. Their telephone was busy with calls of aid, work, support, etc. The newspaper ran follow-on stories about the conferences that were being set up with Cities Service, and the company spokesman's statement that nothing inequitable would be allowed to happen. It was quickly clear that the couple, at least, were going to keep their home.

But none of this really touched on the importance of the case so far as we, as computer professionals, are concerned. From our point of view, a system had been designed and executed which allowed someone to get unreasonably into debt, and which therefore had resulted in a public outcry. That, and that only, is the center of the matter.

Other Professions React

In other professions such a result could, and often would, result in a new hearing, and the people involved would stand quite a good chance of being thrown out of the profession for unprofessional conduct. In the future our profession may also have such a body, but that is not

yet near. Not, at least, until our profession is able to react as firmly as did the people in Boston when they saw systems which failed to protect against unreasonability.

Personally, I think that all the people involved should be severely reprimanded, but allowed to continue in the profession on the grounds that no one had previously understood the implied essential need for avoiding unprofessional results in systems.

And Check for Unfairness

And I also think that everyone of us should both start righting

this point in an explicit requirement of all our systems, and start reviewing our current systems so as to install such precautions.

Those are my personal opinions — but what I am very certain of is that the question of whether the responsible people should be "decharted" for allowing this occurrence is one which definitely should be openly studied by the profession.

What do you think?

© Copyright 1970 Alan Taylor. Reproduction in whole or in part forbidden. The views expressed in this column do not necessarily reflect those of *Computerworld*.

The Taylor Report

By Alan Taylor



charges have been computed. A very effective system, much better than many others I have seen.

And its system is well maintained as well. One of the parts of the computer output is available for notes — perhaps about badly overdue accounts; or about other items. Normally, this is not used, so that instead every month I find a little reasonable, and non-advertising, message.

Perhaps it is wishing me a Seasons Greetings, or warning me about care while driving. But it is something appropriate, and something that shows that the system is human.

Nice Dunning, Too!

Even when the first dunning notices about overdue accounts come out, the system is carefully maintained to appear human. I remember I had one once which quite amused me. It read: "It's unusual — we haven't received your payment. And as you are

ARE YOU PLANNING AN UPGRADE FROM AN IBM 1130 OR MODEL 20?

If so, you can cut computer costs by sharing a computer. For further information write: President, The Silber System Inc., 430 East 56th Street, New York, New York 10022.

THE SILBER SYSTEM INC.

Data Motivation Inc.

IS STARTING ITS SECOND YEAR

AS ADVISERS TO EDP EQUIPMENT MANUFACTURERS IN THE DEVELOPMENT OF OEM...

- * MARKETING & SALES ORGANIZATIONS
- * MARKET/PRODUCT EVALUATION
- * NEGOTIATION OF MEANINGFUL OEM BUSINESS

PLEASE CALL OR WRITE FOR FREE BROCHURE.

DATA MOTIVATION INC.

52 Park Avenue, Park Ridge, N.J. 07656
Tel: (201) 391-0126

READY FOR COMBINED DOS RELEASES 22 & 23 SYSTEM GENERATION?

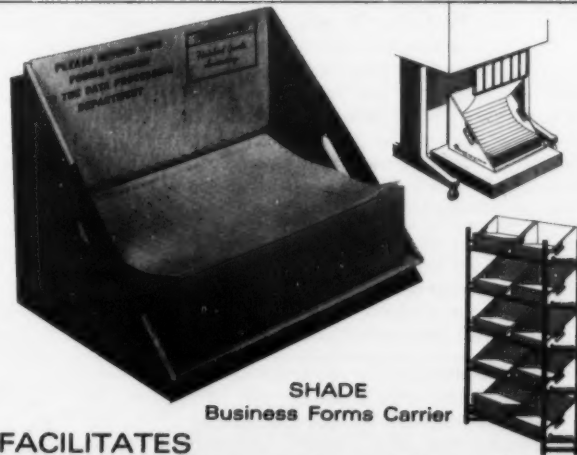
ILC's System Software Engineer is ready to plan, design, and generate your new DOS combined release 22 & 23 with complete consideration of your facilities and special features to provide your installation with better machine utilization.

- * Increased Throughput
- * Optimized Work Files
- * Complete PTF Maintenance
- * Increased I/O Efficiency
- * Any Batch, MPS, or BJB Environment



INTERNATIONAL LOGIC CORPORATION

BOSTON • SAN FRANCISCO • LOS ANGELES • TOKYO



FACILITATES Storing-Stacking-Handling

These practical forms carriers, with convenient hand holes, make it simple for operators to carry a full case of forms with ease and without waste motion. They are ideal for stacking forms as they come out of the printer, and can be used for input as well.

Hi-test corrugated construction prevents scuffing and waste, and keeps forms fresh and orderly. Creates a neater and more uniform storage area, and you'll improve your inventory control, too. Increase the efficiency of your whole department with this sturdy, economical, and practical forms handling device. Thousands now in use in the Midwest

SIZE	PACKAGING	PRICE PER CARTON
14 1/2"	10/CTN	\$15.80
10 1/2"	10/CTN	\$15.16

Larger Quantity Prices Available on Request - WRITE:



SHADE BUSINESS FORMS, INC.

SPECIALIZING IN CARBONLESS CONTINUOUS FORMS
P.O. BOX 470, GREEN BAY, WIS. 53405 PHONE 414/336-5741

Project and People Control — Part II

What Are the Techniques for Fixed-Price Contracts?

By Elliot Raphaelson
Special to Computerworld

For fixed price contracts, reporting requirements should be a little more complex. Figure 1 illustrates a sample of a possible reporting scheme. Note that the report identifies, not only the dollar amount expended to date, but also the projected expenditure anticipated

The subject of this article is effective project control techniques for fixed-price contracts. This is the sequel to techniques for time and materials contracts presented in the last issue. Subsequent articles will deal with individual control, intermediate, and long-range planning.

for this job.

It should not be the case that for all jobs the projected expenditure should be a linear extrapolation of historical results. In that case, the individual preparing the report is not doing adequate analysis.

A projected loss on a job may indicate one of the following:

- The client has asked for changes which the consulting firm has accepted without renegotiation.
- The analyst assigned to the job is not doing an effective job. (Obviously this can happen on a time and materials job as well).
- The job was not defined well enough to be bid on any form of fixed basis.
- The estimators of the job did not do a proper bidding estimate.
- Bad test turnaround time without proper controls was built into the initial contract.

Changes Without Renegotiation

Obviously a consulting firm will not make any money on fixed price contracts if it allows the client to make many modifications.

It is a sound practice not to accept any modifications unless it can be demonstrated that the modifications will not materially affect the costs of doing the job. A consulting firm that cannot say no to free modifications on fixed price jobs will not stay in business long.

Analyst Ineffective

If the analyst assigned to the job is not doing an effective job, he can be replaced with a more competent individual, or informed that his performance is not satisfactory, and he should make every effort to make up for the lost time.

Management of consulting firms must be able to distinguish between the individuals who are more effective on time and materials unstructured assignments and those who are more effective on fixed-price jobs. The individual who may be exceptional in handling a well defined programming task may be a "bust" at defining a system which has a number of loose ends.

Job Not Defined Properly

No job should be bid on a fixed-price basis unless the requirements of the job are specified clearly in writing. The consulting firm that accepts a fuzzily defined system under fixed constraints is looking for trouble.

The analyst(s) assigned to the job should not be penalized or placed under extreme pressure because of poor job definition. The individuals assigned should be

Viewpoint

informed as to the situation and asked to do their best. They should be informed, however, that the probable loss on the job is not due to incompetence on their part. In fact, they should be informed that any extra efforts on their part to minimize or eliminate the loss will be rewarded.

Poor Estimate

Some fixed priced estimates will be poor. Even the best estimators can err. The situation should be handled in exactly the same way as the third situation, poor job definition. The personnel assigned should be informed as to the situation and asked to do their best under adverse circumstances.

Test-Turnaround Time

If a job is behind schedule because of poor test-turnaround time at a client's site, then the consulting firm should not suffer.

The consulting firm can protect itself in one of two ways: specify in the initial contract and minimum computer test turnaround required and the additional costs and time slippage associated without this minimum turnaround time; or have an option to use another computer facility at the client's expense if minimum computer test turnaround is not met. Naturally the second option is of no value if alternate computer time is not readily available on conveniently located facilities.

Elliot Raphaelson is director of research and development for CGA Computer Associates, Inc.

Manpower	
Initial manpower estimate (man-weeks)	6
Manpower expended to date	3
Scheduled manpower expended to date	4
Manpower variance	(favorable) 1
Schedule	
Percent complete	70%
Scheduled percent completion	70%
Current slippage (weeks)	0
Actual start date	12/15/69
Scheduled completion date	1/30/70
Anticipated Completion date	1/30/70
Anticipated slippage	0
Profit/Loss	
Maximum fixed price	\$4,500
Projected expenditure	3,750
Variance	(favorable) 750

Figure 1. Fixed Price Status Report (Weekly) 1/15/70

Facilities Management — Part II

How to Tailor the Service to Individual Requirements

By Robert W. McGeary
Special to Computerworld

Not all facilities management contracts are alike. The broadest definition of the service would involve the facilities manager taking over complete responsibility for the company's data processing function. In this instance, the hardware would be owned or leased by the facilities management firm, which would also place on its payroll all personnel connected with the installation.

The first part of this article examined the overall advantages and disadvantages of facilities management. The second part explores the variations of this service and the various ways in which it can be tailored to the customer's individual requirements.

The facilities management contractor would also control all systems and programming work, whether of the maintenance or development variety.

In a variation of this "total" approach, the user company might retain responsibility for new systems development.

Or all personnel might remain on the payroll of the user, who would also maintain responsibility for securing the appropriate hardware. In the latter case, the facilities manager would undertake only a management contract for the installation.

Total Contract

These and other variations should be kept in mind when reading the following outline on the type of contracts which may be negotiated. Perhaps the best way to describe the negotiating state would be to list a typical sequence of events leading to a facilities management contract. Let's take as an example a total facilities management contract.

The first step, whether initiated by the user or the contractor, is the submission of a preliminary proposal which fully explains the concept and in broad terms describes the type of services offered and the general contract terms. It also proposes an evaluation study, a prerequisite to developing a final proposal.

During the evaluation study, the facilities management contractor sends in a team of experts to do a complete audit of the customer's data processing installation. On a

typical team would be experts in operations, documentation, programming standards, equipment requirements, systems development, and physical facility engineers.

Generally, the installation is broken into two separate entities, the first of these being the systems currently in operation. This includes any systems maintenance necessary to keep those programs functioning smoothly. The second area would be that of development work, which comprises the systems and programming effort being applied to the development of new systems.

Evaluation Team Questions

Examples of the types of questions posed by the evaluation team would include the following:

- Is the data processing equipment suitable for the present and future requirements of the company?
- Is the physical design of the computer room adequate?
- Are there adequate controls over tape and disk use and storage?
- Is the equipment being utilized in the most efficient manner — that is, is maximum machine utilization afforded by optimum scheduling?
- Is the organizational structure appropriate for the installation?
- Are systems analysts and programmers operating under proper control procedures to evaluate progress against established targets and deadlines?
- Are input/output controls adequate?
- Are the purchasing procedures for supplying the installations well defined and closely followed?
- Is the compensation scale appropriate to the skills level of the personnel?
- To what degree does the development work of the customer correspond to the real future needs of the business?

The above list of questions is not all-inclusive, but is cited only as an example of areas explored by the evaluation team.

Summary of Findings

At the conclusion of its studies, the team summarizes its findings as input to a detailed and final proposal to

the customer for a facilities management contract.

It should be noted that there are instances where the contractor will conclude that he does not wish to submit a proposal because of factors inherent in the organization which would prevent his doing an effective job. An example would be a unionized shop with such strict work rules that innovations and improvements are almost impossible to implement.

The proposal also includes a statement of cost to the customer. The pricing of a "total" facilities management contract, to stay with our example, could be of several varieties.

In one, the contractor proposes a flat management fee above incurred costs. In another, a contingency fee is proposed, with the contractor and the customer splitting the calculated savings on some predetermined basis. In a third variation, the contractor proposes to charge exactly what is being paid by the customer for its ongoing work and to charge separate fees for developmental work on a time and materials basis.

In the latter instance, the charge for the ongoing operation applies only for the first year of the contract. This means that the contractor extracts a fee from any savings he is able to generate during the first year. There are other variations and combinations, but the above three illustrate the basic approaches.

Three- to five-year periods are normal in facilities management contracts, with renegotiations at the end of each year standard in the case of the third pricing arrangement cited above. Typically, the contract will have a termination clause exercisable by either party at the end of each year, with a previous notice of usually 90 days.

Because facilities management answers to a real need, we believe that it will play an important role during the '70s.

The trend to utilization is rising because the EDP field is becoming more and more complex and absorbing more and more of the total corporate budget. Expertise and manpower in the management of the computer function is what facilities management offers to industry against this background.

Robert W. McGeary is president of Lever Data Processing Services, Inc.

THE ADVANTAGES OF BEING EASY

(Thoughts while inscribing on Easy Writer)



An easy set up.

Click. Good ol' cartridge. Try setting up one of those other key-to-tape units, and you'll agree. Umpteen steps just to get it threaded. The Data Action 150 Magnetic Data Inscrber with its self-threading cartridge gets a girl off and running.

When a pass is made.

Eight program levels and variable length records mean keying any record in one pass. Forget the old 80 character limit. (Think 720.)

A reputation for being fast.

Easy Writer's familiar keypunch keyboard, pushbuttons and English display make inscribing a breeze. Meaning a girl can equal keypunch speed on the first Data Action day. From there . . . onward and upward.

How every girl wants it said.

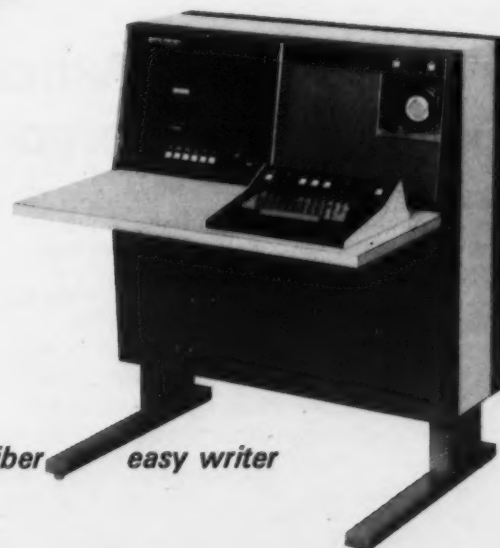
No confusing codes on Easy Writer. That English display tells what's happening on every record.

When you make a mistake.

Oooops. Tap, tap, tap. That's how easy error correction is. Instead of re-keying a whole record, just backspace and re-key a few characters.

Lower input costs make Easy Writer easy on the budget. Which in itself is good reason to write or call Data Action. Go ahead. It's easy.

4445 W. 77th St., Dept. C806, Minneapolis, Minnesota 55435, 612/920-9200



The 150 Magnetic Data Inscrber *easy writer*

DATA ACTION
THE INPUT COMPANY



Introducing Astron. Now tape's forgotten side isn't forgotten anymore.

Memorex has improved computer tape. Again. This time by turning to the forgotten side. And developing Astron.

Astron's unique, new back coating is scratch-resistant and anti-static. It eliminates two of the most common causes of tape error in high-activity applications. Base film debris. And foreign matter attracted by static charge.

The new back-coating also minimizes permanent tape damage. It eliminates cinching that's caused by layer-to-layer slippage in tape packs. Also offsetting of individual tape layers during fast rewind — a common damage producer when reels are handled by operators.

What's the combined effect of Astron's high-durability oxide coating and our new back coating? Unparalleled tape drive

operational efficiency. And longer tape life.

Memorex Corporation, Memorex Park, Santa Clara, California 95050.

MEMOREX

June 17, 1970

Page 15

DEC Adds Disk, Tape Units and Line Printer to PDP-11

By Christine Magnuson
CW Staff Writer.

MAYNARD, Mass. — Digital Equipment Corp. has developed three peripherals for its PDP-11 minicomputer. The devices are a magnetic tape storage unit, a disk storage unit, and a line printer.

The tape unit, the TC11/TU56, includes control and two 97 in./sec tape transports. The device uses 4-in. reels of tape having three data tracks. Trans-

fer rate is 5,000 16-bit word/sec. One TC11 control unit can be used with up to four TU56 dual transports.

The TU56, which can be used with all other DEC computer lines except the PDP-10 at present, provides storage of over 262,000 words, each 16 bits long. The controller permits direct memory access with parallel data transfers, and bidirectional search, reading and writing of data.

Error checking is provided by redundant recording in which each bit is recorded twice. Also, a six-bit check word is automatically computed to check the parity of each 356-word block as it is written on tape.

The tape unit, including control, costs \$7,700. Additional dual tape transports are \$4,700 each.

The RF11/RS11 disk unit has a transfer rate of 125,000 byte/sec or 62,500, 16-bit word/sec.

One RF11 controller and one RS11 disk provide 256K words of storage. Each word is 17 bits in length (16 bits plus parity). Up to four disks can be used with each controller.

The controller and disk cost \$14,000. Additional RS11 disks are priced at \$9,000 each.

The LP11 line printer prints 356, single spaced, 80-column line/min, under CPU control. Sixty-four characters are utilized, with 80 print positions. The impact printer uses one revolving character drum and one hammer per column.

The printer can handle up to six-part forms using fanfold paper from 4- to 9-7/8 in. wide. Variable spacing is possible with program changes. The processor is interrupted four times per line, with 1,424 transfer/min.

The printer, including interface, costs \$12,000.

First deliveries of the printer are scheduled for August, with



Left — RF11/RS11 Disk Unit; Right Back — LP11 Line Printer; Right Front — TC11/TU56 Tape Unit

deliveries of the disk and tape units scheduled for the third quarter.

Work Station, Auxiliary Keyboard Help Increase Efficiency of TTY Terminals

Users of teletypewriters now have available two accessories which can increase the operating efficiency of their terminals. The pair includes a work station to simplify the use of paper tape and an auxiliary keyboard to speed the entry of numeric data.

A work station for Teletype models ASR-32, 33, and 35 handles winding and unwinding combinations for both the

The station, which is portable, may provide storage space for extra reels, a paper tape supply, or other supplies.

The DL-333 work station costs \$130. Delivery is 30 days.

Data-Link Corp. is at 100 S. Ellsworth, Suite 806, San Mateo, Calif.

IDM Keyboard

Intended for the time-sharing user who prepares numeric data off-line on a Teletype Model ASR 33 or 35, an auxiliary keyboard by IDM Corp. is said to increase operator speed by providing the familiar 10-key adding machine cluster keyboard arrangement.

The keyboard rests on the terminal panel and is connected through a quick connect/disconnect feature by the operator. The unit plugs into a jack that will be installed in the user's Teletype by the local telephone company, IDM said. The keyboard is portable and may be moved by the operator to various terminals as needed.

Basically a rearrangement of the TTY numeric keys, the auxiliary keyboard duplicates the action of the normal keys, which still remain functional.

Additional keys for comma, decimal point, minus sign, space, and backspace are provided. The return key combines the operation of three of the Teletype keys (CR, LF, and RUBOUT) into one keystroke. A two-character buffer is said to permit higher levels of input.

A spokesman for a large time-sharing firm told CW that the device could be extremely useful to anyone entering large quantities of numeric data into a time-sharing or other system.

Priced at \$395, the keyboard

will be shipped to customers starting about July 15, on a six-week schedule.

IDM's address is P.O. Box 954, Hanover, N.H.

Multiplexer/Concentrator Communicates With Up to 240 Lines on 'Any CPU'

SEATTLE, Wash. — A full-duplex multiplexer/concentrator capable of communicating with up to 240 lines, designed for use with "any CPU" and well-suited for minicomputers, is being manufactured by Ikon Data Systems Division of Synergistics, Inc.

This Model 20 multiplexer/concentrator can be used either directly connected to the computer or remotely over DDD telephone lines. When used in the remote configuration, no demultiplexer or communications control unit are necessary.

The Model 20 combines the techniques of time division multiplexing, line controlling, and store and forward switching, the company said.

Efficient line controlling is accomplished through a design that provides for servicing only those lines that are active. Instead of using a time interval to identify the source and address of a message, the asynchronous Model 20 uses a data block which consists of a data record and an address.

Each line is scanned at a rate of 560 kHz. The maximum total I/O rate is 560K char/sec; maximum transmission speed/line is 18.5 char/sec.

Four different codes can be intermixed in the Model 20 for conversion to a code recognizable by the computer. Four different clocking speeds can be intermixed from varying terminals, including teletypewriter, Touch-Tone phone, Selectric typewriter, and CRTs.

The Model 20 operates in code transparent and code translation modes, and is capable of collecting data from some lines more frequently than others, according to Ikon Data Systems.

Error checks include the capability to check and generate parity and perform an internal I/O test by circulating a test character through the system. In the event of communication line

loss, a carrier loss character is generated to the computer.

Through the addition of special audio response line control modules, the Model 20 can be utilized for voice, answer-back applications. Used as a remote concentrator it operates as a buffered stand-alone unit.

Interfaces linking the user's computer and the Model 20 are available, the company said.

The price is \$12,000 and up, depending on configuration. Deliveries are 60 days after receipt of order.

Ikon Data Systems Division is at 2619 Second Ave.

CRT Unit Plug-to-Plug Compatible With Teletype Models 33 and 35

MINNEAPOLIS — A desktop display terminal introduced by Data 100 Corp. is plug-to-plug compatible with Teletype's Models 33 and 35.

Called the Seventy Series Model 73 Interactive Display Terminal, the unit consists of a CRT display and keyboard that can be interfaced with a communications line. The unit uses Ansi character code and displays the 64-character, upper case, 1968 Ansi standard graphic subset.

The Model 73-1 displays 12 lines of 5x7 matrix characters, the Model 73-2 has 24 lines. Characters are displayed either white on a black background or black on a white background.

The keyboard has three sections: an alphanumeric keyboard duplicating the Teletype layout to include shift and control keys for generation of special codes; terminal control and edit keys to move the entry marker, repeat other key actions, clear and display, initiate printout on the optional hard copy printer, and start transmission in the block/edit mode; and an optional numeric keyboard in adding machine configuration.

Storage is provided to refresh the display and to buffer storage for an optional hard copy printer.

The terminal operates in two modes: on-line and block-edit. In the on-line mode, each character entered through the key-

board is transmitted to the computer, which retransmits it to the terminal for storage and display, in an echoplexing operation.

In the block/edit mode, characters are entered directly into buffer storage and are displayed. Displayed data may be changed



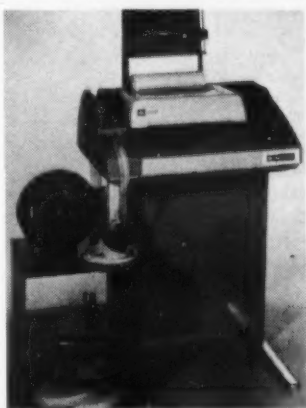
Model 73 Interactive Display Terminal

by using the entry marker and control keys. The "send" key causes transmission of the data to the computer in a block.

Standard connection of the terminal to an acoustic coupler or 103-type data set is via an EIA interface. As an option, the terminal can be provided with an acoustic coupler or 103-type data set.

The basic price for the Interactive Display Terminal is \$3,950, with leases starting at \$118/mo.

Data 100 Corp. is at 7450 France Avenue South.

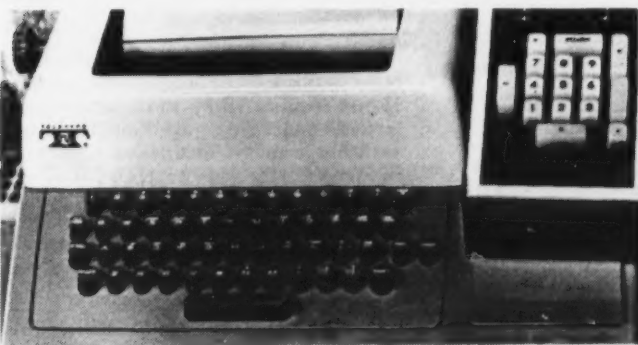


DL-33 Teletype Work Station

perforator and reader, simultaneously. The device is designed to prevent disorderly runoff of paper tape during operation.

The DL-333 work station from Data Link Corp. consists of an electric winder, center-feed unwinder, and storage cabinet. An extra reel mounted on the cabinet for data speed transmissions is optional.

The electric winder utilizes the TTY 8-1/2 in. split reel which holds over 800 feet of tape. No special attachments for mounting are required, the company stated. The cabinet guide mounts directly onto the teletypewriter cabinet and locks in place.



Auxiliary Keyboard

User Builds Basic T/S Job Libraries With Recorder

WALTHAM, Mass. — A recorder made by the Interplex Corp. allows users of the company's System I time-sharing system to build inexpensive job libraries by recording Basic Language programs directly on standard magnetic tape cassettes.



Data-Voice Recorder

The recorder, the Data-Voice Recorder, also enables users to record voice descriptions of the contents of the cassette through a standard tape recorder microphone. The voice description would precede the program on the tape and act as a label, the company said.

The user writes a program on the terminal which loads it into the central processor. When he has finished and tested the program, he strikes three terminal keys (Print, Next, and Line) and the program is recorded on the cassette.

When the program has been recorded, the Data-Voice Recorder lets the user know by printing DN (done) on the terminal printer. The cassette then can be taken out of the recording unit and stored. To load a stored program into the CPU, the user puts the cassette back into the recorder and strikes the input keys.

Programs may be written to run in sequence, or the processor may be in-

structed to stop after each program on the cassette, a spokesman said. The next program sequentially on tape may be manually started by keying "input" and "run" on the terminal.

The Data-Voice Recorder will sell for less than \$200. Delivery will begin this summer with first deliveries of System I. Interplex Corp. is at 400 Totten Pond Road.

Systems/Peripherals Roundup

Tape Unit Added to 520/724 Data System

ROCHESTER, N.Y. — Computer Consoles, Inc. has added an optional magnetic tape unit for use with its Model 520/724 data terminal system. Called the Model 1128, the incremental 1/2-in. tape drive is available in either 7- or 9-track, 800-bit/in. configuration. It has a search speed of 12.5 in./sec and a rewind speed of 50 in./sec.

The Model 1128 is available on a 120-day delivery schedule at a price of about \$8,900 or on lease at about \$230/mo.

Qantel V Accounting System Gets Mag Tape Transport

Qantel Corp., Hayward, Calif., is offering an optional 1/2-in. magnetic tape transport for its Qantel V accounting system. The device is an IBM 360-compatible 9-channel, 800-bit/in. unit which reads and writes at 10,000 byte/sec. Reel diameter is 7-1/2 in., with a reel capacity of 600 feet of tape.

The Qantel tape unit is priced at \$4,950 or \$138/mo on a 12-month lease, with a \$50 installation charge. Maintenance is \$27/mo. Delivery is 90 days.

Add-On Machine Keyboard Added to Novar 550 Terminal

Novar Corp., Mountain View, Calif., has added a 10-key numeric keyboard option for its 5-50 terminal to handle accounting and bookkeeping functions, and provide for telecommunication of both numeric and regular business data.

Designated the 5-02, the add-on machine keyboard is numbered zero to nine with other keys for decimal point, plus and minus signs, an asterisk, a number/pound symbol, field tab, and line return. The feature enables the operator to format preprinted forms such as invoices.

The unit sells for \$490 and rents at \$15/mo.

Keymatic Decreases Price For Series 1090 Encoders

Keymatic Data Systems Corp., Bay Shore, N.Y., has reduced the base prices of its Series 1090 encoders. Prices of the Series 1070 remain unchanged.

The price reduction for the Model 1093 is down from \$12,408. The Model 1092 is down from \$11,572 to \$8,690 and the Model 1091 is down from \$10,604 to \$7,590.

The company is now offering a rental plan for the 1090 encoders. Delivery is now on a 30- to 60-day schedule.

Time-Sharing Plotter Connects To TTY, IBM 2741 Terminals

WILTON, Conn. — A unitized plotting system available from Time Share Peripherals Corp. (TSP) combines a TSP-12 plotter with a specially designed Honeywell X-Y recorder.

Called the TSP-212, the system has a plotting speed of 150 to 225 point/min and connects directly to terminals such as teletypewriters and IBM 2741s. A single-cable connector accomplishes interface through data set or coupler.

An absolute plot dimension pushbutton facility allows continuously adjustable plot sizes up to 10 by 15 in. Subroutines in Basic and Fortran are supplied or are available in public libraries of time-sharing services, the company said.

The address of Time Share Peripherals Corp. is P.O. Box 361.

Series 720 Now 'Silent 700'

Texas Instruments Inc., Houston, has changed the name of its Series 720 Teletype-compatible terminals to the "silent 700" data terminals.

Computer ribbon problems can tie you in a knot.



Knot when you order from JTC

The varieties of computer ribbons are almost endless.

They differ in size, material, inking. And that's just the beginning. Finding the right ribbon for each specific purpose is a job for a wizard.

Fortunately we have quite a few wizards at JTC. We need them because we also have a complete line of computer ribbons for every purpose—including our new *Sterling Silver Nylon Ribbon*.

All JTC Ribbons are long-lasting . . . produce clean and readable printout. They are manufactured according to JTC's stringent specifications and are thoroughly checked during each step of manufacture.

Our wizards are available with our ribbons. They will gladly go over your requirements and make sure you are using ribbons as efficiently and economically as possible.

Next time you need ribbons, ask to see the wizard. The Wonderful Wizard of Ours.



Data Processing Cards
Computer Tapes
Ribbons
Disc Packs
Tape Maintenance



Jersey Tab Card Corporation

649 Rahway Avenue • Union, New Jersey 07083
(N.J.) 201 MU 8-1700 • (N.Y.) 212 WO 4-2930

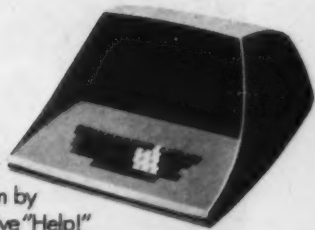


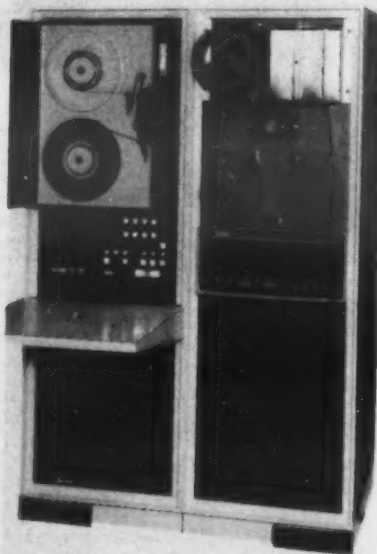
We taught our data entry system to speak a new language: Dumb Blond.

Now there are two trains of thought about data entry. One of them is that you should teach girls to talk to a computer in the computer's language. It's called key-punch. Or key-to-tape, or key-something. The other is to teach the computer to talk the girls' language. It's called simple. We caught the second train. We invented the ENTREX™ 480 data entry system. It's the fastest system going: built around its own computer and disk, it controls

up to 64 individual DATA/SCOPE™ CRT key-stations. To us, it's a CRT-to-disk data entry validate/verify system, with magnetic tape output. To her, it's a typewriter and a nifty little tv screen: She can be the dumbest blond you can find. It's so easy to use, a girl can be trained to operate it in a couple of hours. If a girl can type, she can enter data on our system. If she can read, she can verify it on the DATA/SCOPE™ 480-character display. And

she can get out of any jam by merely pushing the exclusive "Help!" button. We knew you could save time with our system. What we wanted to do is save you money, too. But you'll probably only believe that when you see it. So, see it. Write or call ENTREX, Inc., 113 Hartwell Ave., Lexington, Ma. 02173, (617) 862-7230. **ENTREX**





Per Data Tape System With PDP-8/L

Tape/Disk Unit Used With Minicomputer

HICKSVILLE, N.Y. — A user can configure a low-cost, general-purpose computer system by attaching tape and disk peripherals from Peripheral Data Machines (Per Data) to his minicomputer.

Per Data manufactures controllers and interfaces, coupling them to magnetic tape and disk devices, for use with a variety of minicomputers.

Currently, the list of minis that can be equipped include: Nova and SuperNova, Honeywell 316 and 516, Varian 520/i and 620/i, DEC PDP-8 and PDP-11, Lockheed Mac-16, and Hewlett-Packard 2114, 2115A, and 2116B.

Series T1

The Series T1 Magnetic Tape system handles IBM-compatible tape and consists of a control unit and one to four tape drives. Available in models rated at 7-1/2, 25, 37-1/2, 45, or 75 in./sec, the drives are available in 7- or 9-track models. Any

200, 556, and 800 bit/in. tapes can be read on all of the models. The 37-1/2 in./sec drive can read tape at 1,600 in./sec.

The entire tape system is self-contained and can be mounted on a standard rack. Cables, power supplies, and basic software support are included with the system package. Delivery is 30 to 60 days, and prices range from \$9,500 to \$29,700.

Series D

The Series D Disc System is composed of a disk controller and one to eight fixed head disks with a typical average access time of 8.5 msec. Storage capacity of each disk can be either 500K or 1,000K bits. The controller is an automatic transfer, block-oriented device specifically designed for bus structure I/O.

The system is rack mountable with the disk mounted in a drawer. READ, WRITE, and SELECT routines provide

the software required to put the system on-line, according to Per Data. Prices range from \$6,200 to \$14,700. Delivery is 90 to 120 days.

The Series DT Combination Disc-Tape System is cited by Per Data as an example of the building block flexibility of its devices; it is said to offer the end user a large number of possible choices to suit his needs. A single, fully automatic controller handles any combination of four units: two disks and two tape transports, three disks and one transport, etc. Prices range from \$14,500 to \$42,200. Delivery is 90 to 120 days.

Series 100, 200

The Series 100 and 200 Tape Converter/Translators (TCT) are stand-alone systems dedicated to translating data between punched and magnetic tape systems. Both are built around a minicomputer which allows the systems to perform such functions as converting and transferring data from magnetic tape to punched Mylar tapes. Both series can perform punched tape to magnetic tape, magnetic tape to punched tape, and punched tape to punched tape operations. In addition, the 200 series can do magnetic tape to magnetic tape conversions.

Available minicomputers for the TCT systems include: Nova and SuperNova, Honeywell 316 and 516, Varian 520/i and 620/i, DEC PDP-8 and PDP-11, Lockheed Mac-16, and Hewlett-Packard 2114, 2115A, and 2116B.

The TCT 100 incorporates a controller, a magnetic tape transport (7- or 9-track) and a 300-char/in. punched tape reader and punch. The TCT 200 incorporates an additional magnetic tape drive. Both systems include a Teletype Model ASR 33 for operator communication.

The TCT systems are provided with both application programming and utility routines for diagnostic and I/O purposes. The user has the option of entering his own program in the computer that controls systems operation.

Per Data's system programs use translation tables for conversion between any two coding schemes. Typically, this conversion may be from IBM System/360 hexadecimal code to 8-level code.

In addition, the program controls tape formats and provides for read-after-write/punch verification. The system communicates with the operator via the teletypewriter and the control panel. Messages notify him of such conditions as illegal character, faulty tape, missing write ring, etc.

The TCT 100 is priced at approximately \$40,000, while the TCT 200 is priced at about \$46,000. Both units are available on a 90- to 120-day delivery schedule.

Peripheral Data Machines, Inc. is at 102 New South Road.

Terminal Uses Plastic Card

SEATTLE, Wash. — The Accutone 100 acoustic coupler terminal uses standard plastic dialer cards as input. The manufacturer is Computer Utilities N.W. Inc.

In addition to the photoelectric card reader, a standard Touch-Tone pad is provided for manual input. An integrated audio system makes possible the terminal's use in connection with a voice response system.

Interlock circuits prevent keyboard transmission during card reading. Indicators are provided for power-on, error, and data check conditions.

The Accutone 100 has a maximum transmission rate of 10 char/sec. The device can be easily carried in an attache case, according to the manufacturer.

Price of the terminal is \$25/mo or \$975 on a purchase basis.

The Accutone 100 is available on a 30-day delivery schedule.

Computer Utilities N.W. Inc. is located at 520 Broad St.

TV Data Terminal

The limitations of data communications teleprinters have caused many firms to start watching television — on the ADS 760 Video Terminal. The 760 has two distinct advantages over teleprinters: It offers on-line data editing plus data storage for communications response. It is an attractive desk-top unit featuring a touch keyboard, solid state microcircuit logic and a unique CRT display face. The 760 receives input data which can be edited or added to from the keyboard, stored via screen display, and, upon request, transmitted through a communications link. Other functions are storage and retrieval from a magnetic tape cassette — for character display or data output — and hard copy printout when desired.

Other terminals in the ADS 760 line provide read-only displays for such functions as airport arrival/departure information. Also display units for silent paging in hospitals and at airline desks.

For a more complete education on what the ADS 760 series Video Terminals can do for you, please write.

Ads

AMERICAN DATA SYSTEMS

8851 Mason Street, Canoga Park, Calif. 91306

Telephone: (213) 882-0020

DATA MODEMS / DATA MULTIPLEXERS / DATA TERMINALS / DATA SYSTEMS

OCR Device Combines Filming, Indexing

By Frank Piasta
CW Staff Writer

DALLAS — A user can combine the microfilming and indexing of documents by reading them on an OCR device through the use of a microfilmer developed by Recognition Equipment Inc.

Using a technique called "Input Image," the Input Image Recorder eliminates a step in the data processing function, according to the company.

The recorder is designed to be used with existing Recognition Equipment OCR devices such as the Electronic Retina Computing Reader, the Bar Code Reader/Sorter, and the Input 2 Document Reader, as well as the newly announced Input 80, without interfering with reading or sorting operations, the company said.

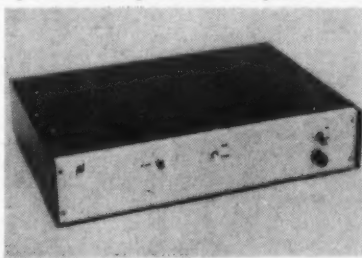
Documents are recorded by the Input Image Recorder onto 16mm film as they are optically read and sorted for computer processing at the same speeds as the paper transports. Speeds up to four times faster than the present, separate operations are claimed at about half the cost.

32:1 or 40:1 Ratio

The recorder employs a cassette that uses 1,200-foot rolls of triacetate base film or 1,600-foot rolls of polyester-base film. Up to 215,000 documents can be stored on a cassette and it can run up to four hours, depending on the document.

Multiplexer Accepts Low-Level BCD Input

LINCOLNWOOD, Ill. — Pivan Data Systems, Inc. is offering the Dijitscan 1000, a digital scanner that accepts low-level BCD (Binary Coded Decimal) inputs in parallel and provides a sequential out-



Dijitscan 1000

put.

The \$420 multiplexer can be used with interfacing devices such as digital voltmeters, counters, and keyboards and with recording devices such as paper tape punches, printers, and magnetic tape recorders.

Dijitscan models are expandable in groups of 10 BCD input. Options are available to interface to a variety of devices, the company stated.

The device uses integrated circuit logic, and is available in rack-mounted or table-top configurations.

Delivery is immediate.

Pivan Data Systems, Inc. is at 6955 N. Hamlin Ave.

Punched Tape Reader Operates at 150 Char/Sec

HAWTHORNE, Calif. — A photoelectric punched tape reader/spooler will be available in late August from Remex Electronics, a division of Ex-Cell-O Corp.

The Model RRS-1150B punched tape reader/spooler features 150 char/sec reading speed and quiet operation, the company said.

Other features are integrated circuits with TTL, DTL, and RTL compatibility; long-life cartridge lamp; low inertia stepping motor/sprocket wheel drive for rapid response for both directions or reading.

The price includes electronics and power supply for \$815.

Remex Electronics is at 5250 W. El Segundo Blvd.

size, the speed of the basic system, whether one or both sides of the document are filmed, and the reduction ratio used. The standard reduction ratio is 32:1 or 40:1.

The microfilm operation can be controlled by the operator of the OCR machine. Two control panels let the operator know when to stop feeding the machine if a paper jam should occur. Document feeders are stopped automatically when the film supply is exhausted.

dp accessories

Each frame of microfilm is identified with a six-digit number. The number, projected on the lens as it captures the document on film, is set originally by the operator on the header input switches and automatically incremented.

The Input Image technique may be suited for credit card organizations that optically read data from charge tickets and perform high-speed sorting of these tickets. Another group of users might be airlines that use OCR equipment to read ticket information, then go through a separate process to microfilm the tickets as a permanent record. Banks that maintain a microfilm image of checks paid could be another large group of potential users.

Accessories for the reader will include a processor for rapid in-house development of film, an electrostatic printer that produces hard copies in nine seconds, and a duplicator that copies the original film onto 16mm, 35mm, or 105mm film.

The basic Input Image Recorder will sell for \$73,825 and lease for \$1,950/mo. First shipments are expected to occur in the third quarter of 1970.

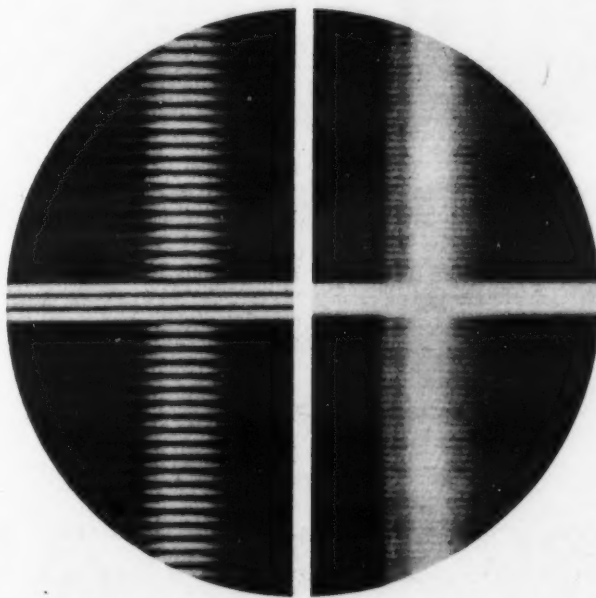
Recognition Equipment Incorporated is at 1500 W. Mockingbird Lane.



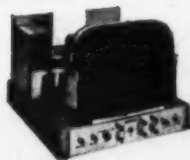
Input Image Recorder

Conrac makes it happen

Automatic Lock-On to Line and Field Rate Changes



Unretouched photos of standard crosshatch pattern at different line rates—675 on left, 1225 on right.



We spotted a need, then came up with the right monitor. We call it RQA. The RQA senses and locks automatically to any field rate from 15 to 60 fields per second and any horizontal line rate between 15 kHz and 37 kHz. That's a big feature, exclusive with Conrac. We put it there for anyone who works with information originating from various scan rate sources.

Our new series is Conrac throughout, with an abundance of key features. All solid state, modular construction. Linearity better than 1% of picture height. Modular high voltage supply. Switchable aspect ratio with dual sets of size controls. Differential input to minimize hum. Video bandwidth in excess of 30 MHz.

RQA comes in 14, 17 and 21-inch kinescope sizes with chassis, rack mount and cabinet configurations. If your requirements call for this kind of monitor, contact Conrac for further details.

CONRAC
CORPORATION

600 N. Rimsdale Avenue • Covina, Calif. 91722


What every computer advertiser should

We're starting as a memory.



COGAR: The Mind Joggers

How can a new company like Heta compete against the Black Knight from Ammonk?




We think harder.

Share A Genie



Share A Genie

"Liberate us from the keyboard."



**ScanData
KeKee
Data Entry**

At Heta, we think harder than the Original Thinkers.




We think harder.

Picky processor?



"Inforex It"

COGAR SAYS:



Fifty men are shaping the computers of the tomorrow. Are you one of them?

We've been selling at the feet of the world's Great Salesmen. Now we'd like to help others benefit from what we've learned.



Big Mother, You're a Bore.

Big Mother, You're a Bore.

ould know about computer advertising.



Unbearable Input?

...the bear is a metaphor for the overwhelming amount of data entering the system. The bear is a metaphor for the overwhelming amount of data entering the system. The bear is a metaphor for the overwhelming amount of data entering the system.

"Inforex It."



Yesterday we landed La Guardia in Hohokus.

...the ship is a metaphor for the overwhelming amount of data entering the system. The ship is a metaphor for the overwhelming amount of data entering the system. The ship is a metaphor for the overwhelming amount of data entering the system.

The Simulators.

How do you please a woman?

...the woman is a metaphor for the overwhelming amount of data entering the system. The woman is a metaphor for the overwhelming amount of data entering the system. The woman is a metaphor for the overwhelming amount of data entering the system.

On-Line Credit-Check.


Are You Doing It for Love?

...the love is a metaphor for the overwhelming amount of data entering the system. The love is a metaphor for the overwhelming amount of data entering the system. The love is a metaphor for the overwhelming amount of data entering the system.



Our fast girls tell their story.

...the girls are a metaphor for the overwhelming amount of data entering the system. The girls are a metaphor for the overwhelming amount of data entering the system. The girls are a metaphor for the overwhelming amount of data entering the system.



COGAR: The Mind Joggers

...the mind joggers are a metaphor for the overwhelming amount of data entering the system. The mind joggers are a metaphor for the overwhelming amount of data entering the system. The mind joggers are a metaphor for the overwhelming amount of data entering the system.



COGAR: The Mind Joggers

...the mind joggers are a metaphor for the overwhelming amount of data entering the system. The mind joggers are a metaphor for the overwhelming amount of data entering the system. The mind joggers are a metaphor for the overwhelming amount of data entering the system.



Proposition from a fast girl.

...the fast girl is a metaphor for the overwhelming amount of data entering the system. The fast girl is a metaphor for the overwhelming amount of data entering the system. The fast girl is a metaphor for the overwhelming amount of data entering the system.

Mr. John C. Callihan, President. Davi-Callihan, Inc.
15 West 44th St., New York, N.Y. 10036 (212) 661-1080

Yes, John, it would be refreshing to be able to discuss our marketing and financial public relations objectives with knowledgeable people who understand the information systems and services business. Please give me a call.

Name _____ Title _____
Company _____
City _____ State _____ Zip _____
Telephone _____

© Copyright Davi-Callihan, Inc., 1970.

There's an agency that knows computers.
Davi-Callihan, Inc.

'False Alarms' to Cost \$ When Non-Bell Units at Fault

By Don Leavitt
CW Staff Writer

NEW YORK — AT&T and the operating companies of the Bell System have begun to protect themselves against a rising number of service calls from data communications users concerning trouble in customer-provided, non-Bell equipment connected to the Bell network.

In tariffs already filed or about to be filed with state regulatory agencies, the companies are including a service charge of \$10 to \$15 which can be applied when trouble is found to be caused by the user's equipment.

AT&T Vice-President William Ellinghaus said recently that

trouble calls caused by user equipment had jumped from a rate of about 150 a month in early 1969 to about 700 a month now. Though Ellinghaus did not view this volume as "alarming" yet, he said that AT&T is certainly "concerned" about the increase.

At least one southern computer data user became "concerned" about the announcement of the service charge policy. He apparently interpreted the phone company's plan as becoming an arbitrary situation. "If our man can't easily spot a problem in our equipment, it must be in yours — \$10 please," is the way the user described

Bell's position.

The local Bell operating company immediately denied having any such intent. A Bell spokesman said the charge would be applied only in those cases where the cause of the problem

phone company said, no charge will be applied.

The telephone companies do, in fact, seem to be following this policy of selective application of the service charge to discourage nuisance-type repair calls.

Even the user who reacted so sharply to the original announcement said that he had not yet been billed any special charge. In that instance, the telephone company has recently provided some real "heavyweight" engineering help, in order to clear up a data line which the user said had been "effectively unusable since it was installed in December." Both user and Bell

appear to have equipment problems and no charge is being applied.

Other large-scale data communications users across the country have indicated that although they had been notified the service charge could be levied, they were unaware of it actually being applied in any of their operations. The users polled, however, were large enough so that each had resident engineers to check out all equipment before any service calls are placed with the telephone companies.

In writing to his local telephone company, the southern data user who reacted to the original service charge policy announcement proposed a reciprocal arrangement: if the utility charged him when his equipment was proven to be at fault, he would expect a credit when the telephone equipment was found to be faulty.

The local telephone company objected, pointing out that it was not allowed to give the user a credit on such a basis. A Bell spokesman said that credit could be given only when a Bell-caused problem resulted in disruption of service for any appreciable time. If a line costs \$100/mo and is inoperative for two weeks, for example, a \$50 credit would be applied to the user's bill, the spokesman said.

Communications

was unquestionably in the user's equipment or his operation. To illustrate his point, he said that if a repairman goes out on call and finds that the user has forgotten to plug in his equipment, a charge will be made.

If there is any question as to the cause of a problem, the



PAPER TAPE BLAHS * A \$300.00 ILLNESS

*Conservative estimates show that on an average, \$300.00 per year is lost, in wasted man hours, by persons hand winding paper tapes. Multiply that figure by the number of your people winding paper tapes by hand to arrive at your Company's loss. The Paper Tape Winder starts paying for itself immediately.

THE PAPER TAPE WINDER IS APPROXIMATELY 5" x 5" x 1" • MADE OF TOUGH ACRYLIC PLASTIC • HOLDS APPROXIMATELY 280 FT. OF PAPER TAPE (33,000 CHARACTERS) • IDEAL GIFT FOR TIME SHARING COMPANIES TO GIVE THEIR CUSTOMERS (DEDUCTIBLE ITEM) • IDEAL FOR STORAGE OR SHIPMENT OF EXPENSIVE PAPER TAPES • USE THEM FOR STORAGE OF PROGRAM LIBRARY OR LENGTHY DATA FILES • IN EMERGENCY CAN BE USED AS AN EXECUTIVE PACIFIER.

PAPER TAPE WINDER — A PRODUCT OF TIME SHARING APPLICATIONS, INC. — PATENT PENDING

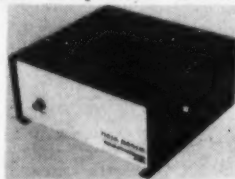


PAPER TAPE WINDER A \$1.25 CURE

Three Data Sets Interchangeable With Bell 103

FORT WASHINGTON, Pa. — A data set that is completely interchangeable with the Bell System 103 is available in three different models from Tele-Dynamics Division of Ambac Industries.

Said to provide full-duplex



Type 7103A Modem

asynchronous digital transmission at rates to 300 baud, the units operate on standard voice-grade telephone lines. The Type 7103A model, which operates in originate-only mode, is used with equipment such as time-shared terminals.

The answer-only 7103B model is geared for use with computer data processing equipment. The 7103C includes automatic access logic that enables it to operate as either an originating or answering terminal.

The solid-state, frequency shift keyed modems are said to have less than 1% distortion. Normally interfaced with equipment compatible with EIA standard RS-232, units are available that are compatible with MIL-STD-188 or CCITT, according to Tele-Dynamics.

The new modems range in price from \$150 to \$330, depending on the configuration chosen.

Tele-Dynamics Division of Ambac Industries, Inc., is at 525 Virginia Drive.

FROM
TIME SHARING APPLICATIONS, INC.
7205 MEADE STREET, SUITE 2
WESTMINSTER, COLORADO 80030

SEND TO

NAME OF PERSON ORDERING (PLEASE PRINT OR TYPE)

FIRM NAME

ADDRESS

CITY STATE ZIP

CHECK ONE

TOTAL

<input type="checkbox"/> 1 @ 1.25 PLUS 0.55*	\$ 1.80
<input type="checkbox"/> 5 @ 1.25 PLUS 1.25*	7.50
<input type="checkbox"/> 10 @ 1.25 PLUS 1.95*	14.45
<input type="checkbox"/> 15 @ 1.25 PLUS 2.20*	20.95
<input type="checkbox"/> 20 @ 1.25 PLUS 2.45*	27.45
<input type="checkbox"/> 30 @ 1.25 PLUS 2.90*	40.40
<input type="checkbox"/> 40 @ 1.25 PLUS 3.35*	53.35
<input type="checkbox"/> 50 @ 1.25 PLUS 3.80*	66.30
<input type="checkbox"/> 100 @ 1.25 PLUS 6.05*	131.05

* SHIPPING AND HANDLING

● COLORADO RESIDENTS ADD 3% SALES TAX TO COSTS OF WINDERS ONLY

● THIS SLIP MUST ACCOMPANY ALL ORDERS

● ALL ORDERS ARE F. O. B. WESTMINSTER, COLORADO

● SORRY NO C. O. D. S WILL BE ACCEPTED

● PAYMENT IS AS STATED BELOW

☐ CHECK ☐ MONEY ORDER ☐ PURCHASE ORDER
☐ BILL ME

June 17, 1970

Page 23

Cybernet Offers Part-Time, Batch Use of CDC 6600

By Don Leavitt
CW Staff Writer

MINNEAPOLIS — Users can now expand their in-house computing capabilities by leasing a CDC 6600 on a part-time basis, through the Cybernet network system of Control Data Corp. (CDC).

This service plan, called Cyberpak, is similar in concept to time-sharing but is applied to the remote batch environment. CDC said that under Cyberpak, a user can contract for only the number of hours of computer time per month that he feels he really needs. He may also prescribe when he needs his time and be assured that a machine will be available for his use.

Priority Levels

Beyond the basic definition of his needs, the user is able to indicate, program by program, the grade of service he wants. There are five choices of priority level for turnaround response, ranging from 'economy' to 'super-express.'

The Cybernet system extends across the country, into Europe, Australia and Mexico. The Cyberpak user can make use of the service, even if his location changes from day to day, the company said.

According to CDC, there are 400 "usable" system hours available on a computer at the 'standard' service level. On that basis, the user may choose anything from 1/16th of the total system hours, which would give him approximately 25 hours of CPU time, to the full system capacity. The user may call for a different mix of job priorities each month, with a different charge for each priority level. Therefore the number of hours available in a given fraction of CPU time will vary from month to month and can only be approximated.

The Cyberpak service, CDC said, might be well suited to the user who has many jobs that need only a limited system, but one or two jobs per month, that require a very large system. This user could buy a contract under Cyberpak, that would give him the number of hours required to process the big jobs. He could then use a smaller system for in-house processing, and revert to the Cyberpak system when

his system was overloaded.

The software support available through a broad range of applications, interactive data management, large-scale linear programming, engineering data management, large-scale linear programming, engineering and electrical analysis. Obviously the user is also free to run his own programs in addition to any he may use from the Cybernet li-

brary.

The user is said to be able to access the Cyberpak capabilities through a broad range of terminals, from teletypewriter units to IBM 360/20 or 25, 1130 or 1800, or even another CDC 6600. A CDC spokesman said that the choice of terminal is limited "only by the user's ability to make the Cyberpak CDC 6600 think that his terminal is a CDC unit."

CDC said that basic prices for the service are expected to run from about \$10,000/mo to \$220,000/mo, depending on the amount of time and the quality of service required.

In specific terms, CDC said that the charges for CPU time vary from \$.40/sec for super-express service, through \$.28/sec for standard, to \$.20/sec for the economy priority.

Cobol Debugging Services Available in T/S

Cobol programmers frustrated by busy in-house installations can now choose from at least three services that offer Cobol compilation and symbolic debugging capabilities on a time-sharing basis, for IBM and Univac systems.

Two of the services based on IBM's Cobol compilers using the 360/67 produce object decks that are usable "as is" under OS/360. The other service based on the Univac 1108 produces object decks immediately compatible with the Exec 8 operating system.

Because of the immediacy of the time-sharing results and the English language approach to identifying problems, users often get their programs "up and running" in hours instead of weeks, according to the developers.

Interactive Data Corp. (IDC) has made its IBM-oriented service generally available as of June 1. Computer Software Services (CSS), the other IBM-oriented operation, has had its service available for about six months.

The Univac-based service, from Axicom Systems, has been in operation since early 1969.

The services are almost identical. The programmer can access

his stored program, edit program instructions directly, compile the program, and get diagnostic messages, at the remote terminal. Working interactively, he can re-edit instructions and re-compile his program until he eliminates all the diagnostics.

The services handle program test runs similarly; the user can let the program run until it hits a snag or goes to completion; or he can set up "breakpoints" to monitor intermediate results.

The breakpoints are identified symbolically by source program paragraph names. Since these address halts have to be redefined before each test, they can be changed as the programmer's interest changes. At a breakpoint, the user can display and/or alter data fields, and terminate or continue the test.

Each of the services allows for identification of program problems in machine language format, but spokesmen said that programmers are more likely to use the symbolic debugging mode. With symbolic debugging, the exact location where an exception takes place is identified by a specific verb, within line or statement number and within paragraph name of the source program.

To solve the program bug, the programmer can refer to data fields by symbolic name, and display and/or alter their contents from the terminal. He can then resume his test at the point where the error was detected, or at any other point he may choose.

Once the user has completely debugged his program in the

able to allow IBM 1130s to be used as I/O devices.

Support Teletype

Axicom said that it can support the Teletype units, Datapoint 3300, Execuport, DCT-2000, 1130, and Univac 9000 series central processors as I/O devices.

None of the vendors require an

```
printf sample cobol

IDENTIFICATION DIVISION.
PROGRAM-ID. 'SAMPLE'.
ENVIRONMENT DIVISION.
INPUT-OUTPUT SECTION.
FILE-CONTROL.
    SELECT OUTPUT-FILE ASSIGN TO 'OUTPUT' UTILITY.
DATA DIVISION.
FILE SECTION.
FD  OUTPUT-FILE
   RECORDING MODE IS F
   LABEL RECORDS ARE STANDARD
   DATA RECORD IS OUTPUT-RECORD.
01  OUTPUT-RECORD.
   02  EMPLOYEE-NAME PICTURE X(20).
   02  BADGE-NUMBER PICTURE S9(6) COMPUTATIONAL-3.
   02  HOURS-WORKED PICTURE S99 COMPUTATIONAL-3.
   02  PAY-RATE PICTURE S99V99 COMPUTATIONAL-3.
   02  GROSS-PAY PICTURE S9(4)V99 COMPUTATIONAL-3.
WORKING-STORAGE SECTION.
   77  WS-BADGE-NUMBER PICTURE 9(6).
   77  WS-HOURS-WORKED PICTURE 99.
   77  WS-PAY-RATE PICTURE 99V99.
PROCEDURE DIVISION.
START.
    OPEN OUTPUT-FILE.
    GET-EMPLOYEE-NAME.
    DISPLAY 'TYPE EMPLOYEE NAME' UPON CONSOLE.
    ACCEPT EMPLOYEE-NAME.
    IF EMPLOYEE-NAME = 'STOP'
        CLOSE OUTPUT-FILE
        STOP RUN.
    DISPLAY 'TYPE BADGE NUMBER' UPON CONSOLE.
    ACCEPT WS-BADGE-NUMBER.
    MOVE WS-BADGE-NUMBER TO BADGE-NUMBER.
    DISPLAY 'TYPE HOURS WORKED' UPON CONSOLE.
    ACCEPT WS-HOURS-WORKED.
    MOVE WS-HOURS-WORKED TO HOURS-WORKED.
    DISPLAY 'TYPE PAY RATE' UPON CONSOLE.
    ACCEPT WS-PAY-RATE.
    MOVE WS-PAY-RATE TO PAY-RATE.
    MULTIPLY HOURS-WORKED BY PAY-RATE GIVING GROSS-PAY.
    WRITE-OUTPUT-RECORD.
    WRITE OUTPUT-RECORD.
    GO TO GET-EMPLOYEE-NAME.
```

A sample source program which the user has printed out on his terminal using the "printf" command.

time-sharing environment, he can shift to his own in-house equipment. With any of the services, the user can have either the source or the object deck punched out.

CSS and IDC support IBM 2741 and 2780, and Teletype ASR 33 and 35 terminals. IDC said that it also supports Terminate and Datapoint devices. CSS includes support for the Datel, Execuport, and Univac DCT-2000 terminals, and has indicated that it will shortly be

initiation fee or minimum monthly billing for the time-sharing service. Connect time costs \$13/hr at IDC, \$6/hr at CSS, and \$10/hr at Axicom. CPU time costs \$.38/sec at CSS, and \$.28/sec at both IDC and Axicom.

IDC is at 486 Totten Pond Road, Waltham, Mass. Computer Software Systems Inc. has its headquarters at 460 Summer St., Stamford, Conn. Axicom Systems Inc. is at 615 Winters Ave., Paramus, N.J.

'Linkmaster' System Defines and Tests Compatibility of 360 Program Modules

NEW YORK — Programmers working in 360 Assembler Language can use the Linkmaster system to define and test separately assembled program modules, according to the developer, Hoskyns Systems Research. With this package, the company said, the user can be sure that the modules will fit together and form an error-free program.

Macroinstruction Set

Linkmaster is a set of macro-instructions for defining the Assembler modules, and a test-bed program for the check-out.

Hoskyns said that the instruction set can perform all module linkage automatically; pass parameters in a concise, flexible notation; and allocate working storage for each module dynamically and in an optimum manner, without recourse to the operating system.

The company added that the module linkage includes the set-

ting-up and chaining of IBM-standard Save areas. With the parameter passing, addressing of data and instructions is performed automatically so that the programmer is totally relieved of register housekeeping. Modules written with Linkmaster can be reentered, Hoskyns said, unless the programmer chooses otherwise.

Fully Compatible

Linkmaster macro instructions are said to be fully compatible with all the IBM macro-instructions, including LINK and ATTACH.

The company said that any number of tests may be initiated in a single run of the test-bed program. During a test, the action of lower-level modules, including file-access routines, can be simulated, which allows testing to proceed without on-line data files.

Results Immediate

The test report is said to high-

light only the changes to the test data brought about by each test execution, thereby reducing the time required to analyze test results. The company also said that the test program recovers from program checks in the module under test, and prints diagnostics, before continuing with the next test.

OS, DOS Versions

Hoskyns said that Linkmaster is available in compatible versions for DOS and OS users. It is supported by five days of on-site training, and documentation. The company said that the package is contractually guaranteed to perform to specification and is "bug-free."

Linkmaster is available for \$17,500, which includes installation and five days of on-site training.

Hoskyns Systems Research Inc. is at 61 Broadway.

STSC APL/360 Package Geared to Shared Large Files

By Don Leavitt
CW Staff Writer

WASHINGTON, D.C. — The file handling capabilities of the APL/360 Terminal System have been greatly expanded by a new software package that is also available as a service from Scientific Time Sharing Corp. (STSC).

According to STSC, random access files under APL/360, typically 32K characters and limited to 192K characters maximum, can now include up to 200 million characters. In addition, the company said, this mammoth data base can be shared in real-time by multiple terminals.

Data Security

Even though the data base is shared, total security of the data is said to be assured. The user who creates the file specifies

which other users have permission to access the file and whether the permission is read-only, append-only, update, or some combination of these types of access. The user's degree of access is included in the account number he enters when he starts to use the terminal, the company said.

A series of functions that STSC has added to the APL/360 Terminal System allow the user to create and then control the file, through calls from his program. Previously, the generation of the data base and its control required special purpose systems programs, the company said.

The ease of file creation and control coupled with the increase in accessible file size is said to make the APL/360 Terminal System a realistic tool for

an airlines reservation system, multiplant inventory control, multidivision financial reporting network, or other remote access applications where a common data base must be shared by a restricted group of users.

Response Time: 1 sec

Average response time for any terminal is said to be one second or less, with 60 terminals active on a 360/50. The terminals can access the same files "concurrently," but software interlocks momentarily prohibit access to a record at the instant it is being updated by another terminal.

The package is available for in-house installation on IBM 360 Models 40, 44, 50, or 65 with 256K memory and a 2314 disk unit, under a modified DOS. A spokesman for STSC said that

the modifications to the standard DOS allow these processors, normally batch-oriented, to be used in the APL time-sharing mode.

STSC said that the APL/360 Terminal System can support the IBM 2740-1, 2741 or 1050 terminals, the Datel 2031, the Dura 1021 and, the Novar magnetic tape terminal. A spokesman noted that Teletypes 33 and 35 are not presently supported, because the APL character set is "too rich" for the teletypewriter keyboards.

Cost of the package is \$12,000 annually. STSC said that this price covers just the company's enhancements to APL, and not the APL processor itself, which is available separately from

either IBM or STSC.

The new capabilities are also available to users of the APL plus time-sharing services of STSC, on local dial-up in New York, Philadelphia, Washington, Los Angeles, and Palo Alto, California.

Under the service plan, there is neither initiation fee nor minimum monthly billing. Connect-time costs \$12/hr and CPU time costs \$.10/sec. The charge for APL "workspace" is \$10/mo for 32K characters on a month-to-month basis. The company said, however, that users who can anticipate their needs on an annual basis would be charged only \$150/mo per million characters of "workspace."

Scientific Time Sharing Corp. is at 2101 S. Street, N.W.



Fussy, she ain't.

Vista makes it big with any mini-computer.

Vista is an alphanumeric display terminal that's fast, silent, easy to read. Far more efficient than her ancestor, the KSR-33 teletype. And completely compatible with whatever mini-computer you're using.

A completely self-contained, stand alone unit, Vista comes with keyboard, video presentation, control and refresh electronics, data phone interface and power supply. All keyboard operations, including cursor movement, are transmitted and received permitting software editing. Standard interfaces connect to modems up to 1800 baud. Parallel and current loop interfaces are available as options. Vista is available for immediate delivery, for as little as \$1495.00. For further details, write for our free brochure or call.



Infoton

Infoton Incorporated, Second Avenue, Burlington, Massachusetts 01803 (617) 272-6660
560 San Antonio Road, Palo Alto, California 94306 (415) 493-0615

PDP-11 Users Get Basic Language

MAYNARD, Mass. — Users of the DEC PDP-11 now have Basic Language capabilities available from the manufacturer.

DEC said that the new capability not only allows programs to be written in Basic on the PDP-11, but programs written in Basic for other computers can often be used on the PDP-11 without modification.

The company also said that the PDP-11 Basic package has a machine-language calling capability that has particular appeal in data acquisition applications. Users can write their programs in Basic

and then call up machine language to communicate with various I/O devices.

The Basic package requires 4K words of core memory, the company said, and is available free to PDP-11 users.

Editorial Service Formed

ANN ARBOR, Mich. — Maxwell Publications has formed a technical editorial service to produce documentation for software houses.

Maxwell Publications is at 1353 N. Main St.

Summer Special

LOWEST RATES EVER AT E.P.G.

CONFIGURATION

360/50	— 512K	2	— High Speed Printers
8	— 9 Track tape drives	1	— 2540 Card/Read/Punch
2	— 7 Track tape drives	1	— 2501 Card Reader
1	— 2314 Direct Access Storage Device	1	— 2701 Communications Control
4	— 2311 Disk Drives	1	— 2780 Terminal

OS-MVT, MFT-II, HASP, RJE

FREE

OPERATORS
TECHNICAL SUPPORT

ALSO: Systems / Programming 30 Keypunch Machines
360 Operations & Programming classes Sysgens Remote Job entry capabilities

CALL:

TED SABARESE at (212) 826-0660
Vice-President

epg

COMPUTER SERVICES
INCORPORATED

345 Park Avenue, New York, New York 10022

IEEE June Show to Feature 'Challenge of Seventies'

WASHINGTON, D.C. — The IEEE Computer Group International Conference and Show, featuring the theme of "Memories, Terminals, and Peripherals: Challenge of the Seventies," will be held June 16-18 at the Washington Hilton.

The conference will be introduced by a "Technical and Market Overview" and will be closed out by plenary sessions on "Systems Architecture" and "Industry Impact." The closing meetings will review the implications of the detailed technical

sessions to forecast how memory, terminal, and peripheral technology will meet the challenge of the 70s.

The program will be international in scope with 150 papers currently under review, including submissions from England, France, Germany, and Japan. M. Allegre, director of electronics in the Office of the Prime Minister of France, is spearheading the European and Asian participation and expects to offer some international technical sessions.

Emphasis will be placed on engineering and design of theme-related software, hardware, and systems; technical excellence, new/advanced landmark papers, and presentation effectiveness.

One of the presentations will be made by J. Peter Ross, vice-president of Quantum Science Corp., a technological information service company.

Ross feels that three major trends will determine computer markets, products,

and technology of the 70s. The rapid introduction of dispersed computer systems will dictate new product developments in terminals, equipment, memories, and software. The movement towards total service because of increasing system complexity will mean that computer services will become the fastest growing

Societies

sector in the EDP industry, expanding from \$7.9 to \$20.1 billion by 1973.

The third factor is the increasing importance of overseas markets and competition. Markets there are increasing 50% faster than those in the U.S., and foreign companies are preparing to attack world markets. By 1973, 44% of U.S.-based computer company sales will be to foreign markets.

Robert A. Sibley to Head FJCC

HOUSTON — Robert A. Sibley Jr., professor of Computer Science at the University of Houston, has been named general chairman of the Fall Joint Computer Conference sponsored by Afips which will be held in the Astrohall here Nov. 17-19.

Members of the 14 societies which comprise Afips will attend to represent every phase of the industry including engineering, manufacturing, research, education, and all forms of application from business through aerospace to medical research.

The theme of the conference will be "Systems and Society." "It's the feeling of the steering committee that it is time to emphasize the computer industry's obligation to society, and this conference will offer us an opportunity to do our part," Sibley said.

Technical presentations and a trade exhibit in the Astrohall will headline the show. Sibley said that total value of the hardware and software on display from nearly 400 manufacturers is expected to exceed \$300 million.



Robert A. Sibley Jr.

ACM Group to Hold Personnel Meeting

NEW YORK — The 8th Annual Computer Personnel Research Conference, sponsored by ACM Special Interest Group of the same name, will be held June 22-23 at the Center of Adult Education, University of Maryland, College Park, Md.

David B. Mayer, chairman of SIGCPR, said that the purpose of this two-day conference is to identify and discuss the common problems and needs of those individuals concerned with the selection, training, evaluation, and other aspects of the management of computer personnel. Research and problems reported are of interest to personnel managers, managers of computer installations, and all those concerned with personnel administration of computer centers.

Special Periods

Representative papers will be presented throughout the two days. Special periods are scheduled in each of the four sessions for open and challenging discussion. Monday's theme at the conference is "New Perspectives On Training," with the opening remarks being made by Robert A. Dickmann, program chairman, of the Johns Hopkins University applied physics laboratory.

Dr. F. Kendrick Banks, General Business Division, University of Colorado, will make the keynote address on "Data Processing Curricula at the Secondary Level."

Robert Reinstedt of the Rand Corp. is Tuesday's session chairman, the theme of which is "A Behavioral Science View of Computer Personnel."

On Wednesday there will be an open general meeting of SIGCPR. Members and special guests may attend.

Registration and information requests should be addressed to: Director of Institutes (CPR), Conference and Institutes Division, Center of Adult Education, University of Maryland, College Park, Md. 20742.

The registration fee is \$45 for ACM and/or SIGCPR members, \$55 for non-ACM or SIGCPR members.



Our Minicomputer Supplement Closes July 10th.

If you're an advertiser of minis, mini-peripherals, or minisoftware, we'd like to direct your eye to a maximedia buy. Our *Minicomputer Supplement*.

Computerworld offers the highest all-paid circulation and the lowest CPM of any computer publication. And we reach 20,000 computer installation sites which use over 80% of the 15,000 odd mini and midis operating in the U.S. today.

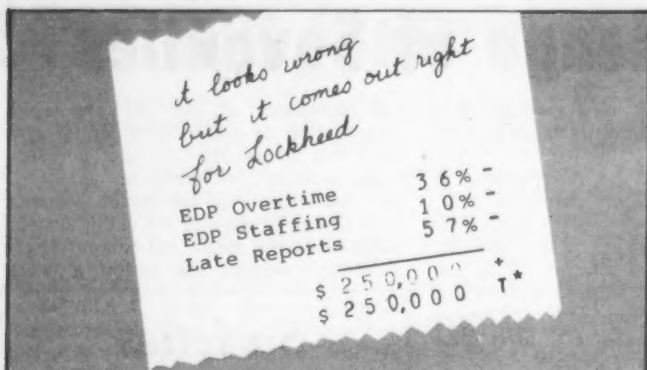
Of our more than 35,000 paying subscribers, 18,500 are top systems executives. Better known as the Primary Buying Influences of computer products and services.

Edited specifically for computer users, our *Minicomputer Supplement* will be of special interest to top systems executives. We'll be identifying the so-called 'minicomputer invasion' and what it means to your company and customers. We'll also be setting the records straight on important questions concerning minicomputer costs, machine selections, applications, and trends.

So, if you want a maximedia buy, call the Computerworld representative nearest you or (617) 332-5606 for a big spot in our *July 29th Minicomputer Supplement*.



COMPUTERWORLD



*\$250,000 Savings using the DEADLINE! Computer Center Planning and Scheduling System.

Late EDP reports, backed-up schedules, and reshuffling of job assignments is a costly proposition. The DEADLINE! software package provides Lockheed-Georgia with a way of scheduling its entire EDP center according to Lockheed's own priorities with efficient time use. Annual cost savings are estimated at \$250,000... in the data center alone. For savings in any size EDP center, contact: Director of Marketing, Synergistic Cybernetics, Inc., 7777 Leesburg Pike, Falls Church, Va. 22043. Phone: (703) 821-2500.

SCI SYNERGISTIC
CYBERNETICS
INCORPORATED

Canada's Session '70: Small Attendance And the Usual Conference Confusion

By Robert L. Glass

Special to Computerworld

VANCOUVER, B.C. — What was billed as Canada's largest and most important data processing and management sciences conference turned out to be something less than expected.

Session '70, a joint conference of the Canadian Information Processing Society and the Canadian Operational Research Society, was held here June 1-3 and attracted about 700 people to the three parallel streams of technical sessions.

One session was oriented to the computer, one to operations research, and one to computer interaction. The theme was "looking back and looking forward."

Keynote speaker was Canadian Justice Minister John Turner, who spoke on "Computers, Privacy, and the Law," covering the problems of computers and the law in the 1970s [CW, June 10].

The usual computer conference

confusion was augmented by several new elements: the uncertain value of the suddenly "unpegged" Canadian dollar caused some banks to refuse to accept American money, a decided inconvenience for U.S. visitors; a strike of rental car

sequences of allowing the telephone company to base a competitive data service on its monopolistic transmission service. A British Columbia telephone company speaker responded by pointing to his company's inability to capitalize on its "monopolistic edge" in the area of Telex vs. TWX, where the Telex (non-phone company) service is roughly five times as popular as TWX.

The session on computer languages had a strong PL/I flavor. D.M. Tucker of IBM discussed its past and future, concentrating especially on the eight IBM-supported PL/I compiler-interpreters.

A variety of technical and emotional positions highlighted the technical sessions. Lampson's statement, "A few years ago only a confirmed pessimist would have predicted the current confused state of the art in operating systems," contrasted markedly with that of R.F. Moore of NCR who viewed "A window to the 70s through which dramatic advances of the 70s will outshine those of the 60s."

Societies

employees blocked some airport facilities and added to the transportation problems of others; a mail strike further complicated matters; and Dr. A.J. Perlis of Carnegie-Mellon University, a scheduled speaker, became ill prior to the conference and was replaced by Dr. Butler Lampson of Berkeley Computer Corp.

The distant exhibit area was sparsely sponsored and attended.

Sparring Matches

Computing service and telephone company speakers participated in gentle sparring matches over the problems of data transmission and data services, and who should be allowed into which business.

One speaker warned of the potentially ominous con-

Schueckler Heads GET

BUFFALO, N.Y. — Norman M. Schueckler has been elected President of the General Electric Two-Hundred Computer Users Association (GET) at the recent meeting of the national group of companies and institutions who use GE computers.

Schueckler is a vice-president of Graphic Controls Corp. and general manager of the company's Computer Systems Division, a supplier of remote terminal computing and associated services.

GET, which now has about 510 members representing 225 separate installations, was organized in October, 1960, by computer users to advance the state of the art of the GE200 line.

SELLING LEASING



DATA AUTOMATION
SERVICES, INC.

4858 CASH ROAD
DALLAS, TEXAS 75247

[Home Office: (214) 637-6570]

318 West 28th Street 7790 N.W. 7th Ave.
Los Angeles, Cal. 90007 Miami, Fla. 33150
(213) 747-0587 (305) 693-3911

1850 DeKalb Ave. N.E. 6366 Gross Point Rd.
Atlanta, Ga. 30307 Niles, Illinois 60648
(404) 377-3962 (312) 647-0166

1401 COMPUTERS Sale - Purchase - Lease

1401 Systems wanted now
or will purchase leaseback
until your release date

All Model 1401s
available for sale or lease

Unit Record Equipment For Sale or Lease

024 026 082 083 084
085 087 088 402 403
407 514 519 552 602

ALL WITH IBM M A

(also 7330, 1311, 729 drives)

Unit Record Wanted

Will purchase all types of
unit record equipment now
with or without IBM M A

INTERNATIONAL DATA CORPORATION

has recently completed a multi-client study on...

DACAP

Data Capture Equipment Marketplace



International Data Corporation
60 Austin Street
Newtonville, Massachusetts 02160

IDC is the largest market data gathering, research,
and consulting firm in the computer industry.



you are managing a DP operation — or are putting together
a management information system...

your budget is limited, your staff small, and your computer not a giant...

your management needs reports that are based on file information...

then — you have problems of creating, maintaining, and retrieving information from files.

These are severe problems when your management needs customized reports quickly but there is no easy way for them to generate their own. You, or your staff, must do this for them. Results? Fair to good, but never 100% satisfying.

Until now there has been no easy answer. FILE EXEC 70 is a system that your managers can learn to use in two days. It is not necessary for them to write programs, but only specify parameters. Users only need to know the external characteristics. As DP manager, you may wish detailed information on internal characteristics of FILE EXEC 70 to evaluate it.

First there is the *System Description* covering characteristics of language types and forms, modes of use, file media, documentation, etc. *Data Structure* includes types of groups, entries, files, and their identifications. *Functions* precisely defines the preceding items and also covers interrogation, selection criteria, file creation, etc. *Storage Structure* specifies storage representation for item levels, entry and group levels, file levels, and multiple files. *Operational Environment* gives details of basic and expanded hardware, software, and systems requirements. Prices are also provided.



Pioneer Data Systems
Suite 308, Merle Hay Tower
Des Moines, Iowa 50310 (515) 276-6746

UNDER \$50-K COM

6. How about reliability?

A computer output microfilmer's reliability is entirely dependent on the intrinsic trustworthiness of its parts.

The PTI 1300 uses solid-state electronics, interchangeable circuit boards and high MTBF components throughout.
757 North Pastoria Avenue
Sunnyvale, California 94086
(408) 732-4940



PERIPHERAL
TECHNOLOGY
INCORPORATED

Chance for Programming Career Draws a 'Big House'

RAHWAY, N.J. — The requirements are unusual — a high school diploma and at least two years left on your sentence — but the computer programming classes offered every Monday night at New Jersey State Prison here attract a full house and have launched several ex-convicts into responsible and well-paying careers.

The program was set up five years ago by Frank Ponzio of New Providence, N.J.

"Programming is an excellent form of rehabilitation for a convict, because it forces him to make a decision: he can either learn something that will let him make an honest living, or he can go back to crime," said Ralph M., who was paroled about a year ago, and now works as a programmer in a computer systems company. "Once he decides to take the program, he is totally involved; he works during the day at his assigned job and spends nights and weekends doing programming."

Quite Awkward

For James C., who has been out of prison just over three years, the program was especially awkward — he learned programming without the benefit of a computer. "Our class would get an assignment on Monday night, and we would work on it during the week," he said. "The students would flowchart the problem and write a program to solve it. Ponzio would collect the completed assignments the following Monday, edit the program, debug it, and run it on the computer he used at work. It sometimes took two weeks before we would get the program back. It could get pretty awkward."

Ralph M. was in the class when it received its own computer, a DEC PDP-8/S. "Getting the computer made all the difference in the world," he said. "We found out what it meant to enter a program through the switches on the control panel and do our own assembly. The class could also write and run its own programs and see the results."

"The people in the class have a lot of devotion to it," said Ponzio. They have to give up most of their recreation time in the evening — watching television or playing basketball — and spend it doing assignments.

The dropout rate in the course is high — over 50% of the people quit for one reason or another. "There are valid

reasons for the high dropout rate," he said. "Rahway is a maximum security prison; some are transferred, others take minimum security on the prison farm, and still others are paroled. But some people stay voluntarily, and trade off getting out early or being transferred to minimum security for staying and getting more programming experience."

Wasted Time

James C. turned his prison term from what could have been a wasted time into the base of a fulfilling career. "My first job out of prison was in the molding room of a factory, but soon after I got a job as a programming trainee," he said.

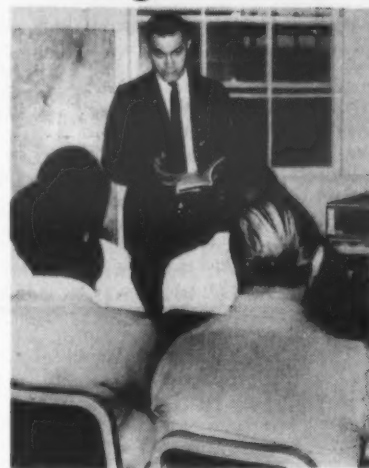
While he was in prison, Ralph M. was in a position to spend eight hours a day, five days a week with the computer. In addition, he taught the other inmates in the course, which, he believes, helped him learn more. "The others in the class would ask questions, most of which

started with the words 'Why?' and 'How come?' Having to answer these on my feet in front of the rest of the class helped me understand programming much better than I ordinarily would have."

Impact and Incentive

Ponzio keeps in contact with his students who are out of prison, and keeps his students up to date on their progress on the job. "They are constantly asking how the parolees are doing," Ponzio said, "and I tell them the latest news. It has a lot of impact and gives them some incentive."

Ponzio plans to keep the course going. "Programming is one of the best ways for an ex-convict to get a meaningful, challenging job," he said. "Many companies that do defense work cannot hire convicted felons, and many parolees who have no job experience find it hard to get work. But there is a shortage of programmers, so the jobs are there for people trained for them."



Students at Rahway State Prison, Rahway, N.J., are taught programming on the DEC PDP-8/S every Monday evening by Frank Ponzio.

SHHHHHH!

(There is a new high speed plotter afoot.)

LOUDER!

We said, there is a new high speed plotter afoot that plots any graph, regardless of complexity, on a standard 8½ x 11 page in less than seven seconds. Quietly.

It doesn't cost \$18,000. Or \$12,000. Or even \$8,000.

It costs just \$6,500.

We can plot graphics like this ... fast!

The Matrix 200 is ideally suited to such applications as hard copy output from CRT graphics displays. It gives you graphics output capability for digital computer systems and off-line storage devices.

It is also ideal as a remote graphics hard copy display device in communications applications.

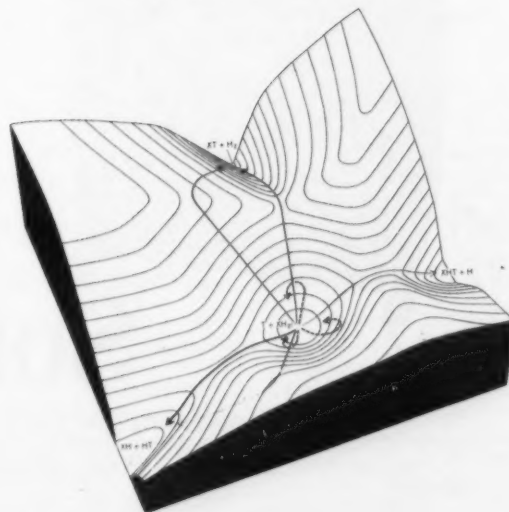
Need a printer/plotter combination? We got. The Matrix 200A can be operated on-line or off-line for alphanumeric printing and graphics — combining the two on a single piece of paper. Printing speed: 600 character lines per minute.

We also have four other printers and plotters. And they all use Versatec's advanced electrostatic writing technique.

OKAY, LET'S SHOUT!

The name is Matrix Printers/Plotters.

The company is VERSATEC ... leading the silent generation.



See us in I.S.I. booth at DPMA
Seattle — June 23-26

VERSATEC

10100 Bubb Road, Cupertino, California 95014, (408) 257-9900, TWX 910-338-0243

CAI Sales Jump \$500 Million Expected by '75

NEW YORK — Despite lingering resistance by teachers and the problem of capital outlay by school boards, sales of electronic equipment in education will rise from \$240 million in 1970 to nearly \$500 million in 1975 and to more than \$750 million in 1980, according to "samson trends," a service of Samson Science Corp.

The mid-1970s will see some of these systems satisfactorily operating, according to the detailed analysis of "samson trends." By 1980, Samson predicts, most major school districts in urban areas will have operational systems offering both drill-and-practice and reference material retrieval.

In 1966, IBM and RCA assumed that computer-assisted instruction (CAI) had reached the point where commercial exploitation was feasible. Other companies jumped on the bandwagon with high expectations that were not realized. They had limited, but significant, successes, especially when restricted to drill-and-practice instruction, Samson said. CAI drill-and-practice systems are economically viable when costs do not exceed \$1 per student hour of operation.

More Challenging CDP Exam Caused More Failures

By Donald J. MacPherson

The Certificate in Data Processing affords recognition to those data processing people in management-oriented positions who have acquired a core of diverse knowledge considered essential in this field. The CDP program is designed to provide a generally accepted means of testing and recognizing individual knowledge in the field of data process-

ing, and to provide assistance and information that can be helpful to educators and others concerned with future improve-

Viewpoint

ment of the profession.

The key to this effort is the individual CDP holder. He must

reflect these objectives in his accomplishments and the measure he is not only willing, but able, to give of himself toward the advancement of the data processing profession.

The demands on those individuals who aspire to management positions, or work directly with top echelon user management in the satisfaction of their needs, within the framework of the data processing industry, add complexity in an ever-changing environment. Demands on those seeking the CDP attempt to keep pace.

Since the inception of the program in 1960, the examination has been upgraded and modified under the guidance of the DPMA Certification Council. At intervals deemed appropriate by the council, the requirements under which applicants are qualified to sit for the CDP Examination have been raised; the examination itself has become more difficult. These changes are neither capricious nor are they motivated by any form of sinister intent. They have been implemented by the DPMA Certification Council through an evolutionary process designed to anticipate the increasing demands on data processing management personnel.

Two Years of College

For example, candidates for the 1970 examination were re-

quired to have the equivalent of two years' college education. This qualification has been in effect since the 1966 examination, and will remain in effect through 1971. In 1972, candi-

Donald J. MacPherson, CDP, and education director of the DPMA, places into perspective the 10-year development of the CDP program sponsored by the society as well as its future expansion plans. This year, a smaller percentage of applicants passed the February CDP Examination (CW, June 10).

dates must have a Baccalaureate degree from an accredited college or university, unless they were qualified to sit for the examination, whether they applied or not, on or before the 1971 examination date. This change in academic requirements was based on a decision of the Certification Council made in the winter of 1968.

Several factors prompted this change. Perhaps the least relevant in the eyes of many, but no less real, a Bachelors Degree is considered the minimum in formal education for management personnel by a predominant number of organizations. Equally important is one of the basic reasons the degree requirement exists in the first place. Considerable faith is placed by employers in the idea that the broad education which a college degree represents enables an individual to be more flexible as a consequence of his diverse studies, thus more adaptable to the demands made upon him in a management situation.

Specific knowledge which can be applied in a job situation is less important, from this viewpoint, than the facility to deal with diverse problems and seek out answers when the way is not clear. It is this facility which an extensive formal education tends to develop in an individual. If specific knowledge is acquired in

the process, which can be applied on the job, so much the better, of course.

Credit for Each Section

Since the first CDP examination was offered in 1962, through 1969, candidates have been required to pass all of its sections to qualify for the Certificate in Data Processing. Otherwise, candidates were required to sit for the entire examination on subsequent re-takes. Beginning with the 1970 examination, candidates will be given credit for each section passed, provided they pass two or more.

Over the years, the Certification Council has passed approximately 50% of the candidates, depending on the cutoff score which it establishes each year after a careful analysis of the performance of each question relevant to the candidate population. Approximately 30% of the candidates who took the 1970 CDP Examination have been awarded the certificate. In part, this resulted from the increased scope and difficulty of the examination. It was increased from four to five sections.

Material comparable to past examinations was intentionally more difficult. This is in keeping with the council's policy to make it more challenging each year. The 1970 examination lasted a full day, compared to one half day as in previous years. The Certification Council recognized the difficulty candidates face in reviewing for the breadth of material encompassed in the entire examination, which was always necessary in the past. It is now even broader in scope, and each section is materially longer. That a smaller percentage of candidates passed the 1970 CDP examination is the inevitable consequence of the increased comprehension and challenge of the CDP Examination as it has evolved through continual upgrading.

SELLING WELL IN DENVER?

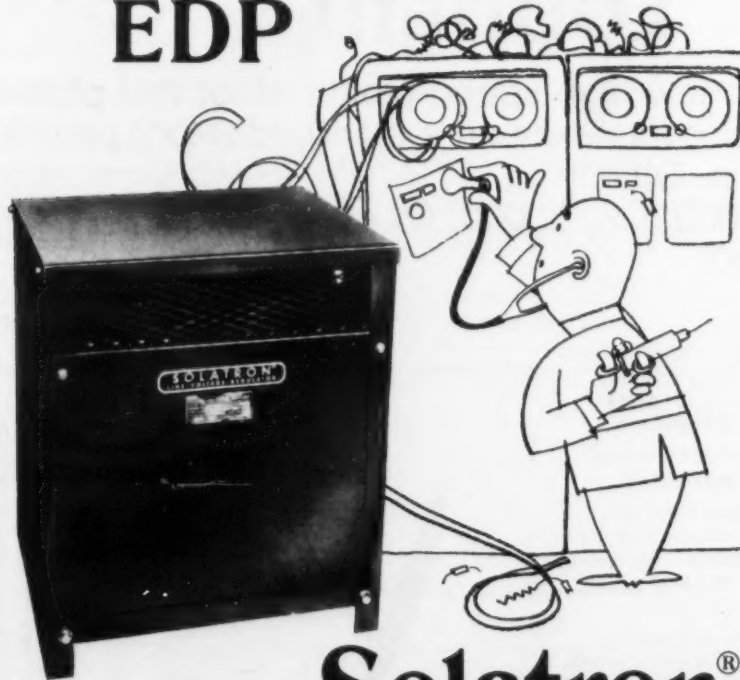
If you don't have coverage in Denver, Kansas City and the other markets in the Rockies and the Plains, we can help you. Call or write . . .

SUMMIT SYSTEMS, inc.

Jack Zimmerman and Associates
300 East Hampden Avenue
Englewood, Colorado 80110
303-761-3171

"Marketing computer products in the Rocky Mountains and the Great Plains"

R& for Up Tight EDP



Solatron®

Suffering from digit drops? Parity loss? Losing your mind over sick components and damaged circuit cards . . . not to mention total memory loss?

The symptoms show . . . You've been exposed to input voltage dips and surges!

Electrical equipment can cause severe voltage variations. Protect your EDP equipment . . . BE IMMUNIZED WITH SOLATRON®!

Designed for computers, Solatron regulators maintain an even line voltage input within $\pm 0.5\%$ for line changes. The fastest response time available, correction begins in the first half cycle with complete regulation taking place within 1/5 second.

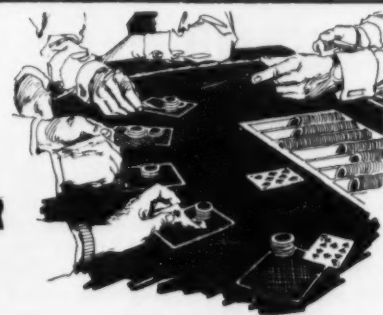
If your computer is getting up tight . . . we have just what the doctor ordered: SOLATRON®. Call (312) 439-2800 or write: Sola Electric, 1717 Busse Road, Elk Grove Village, Illinois 60007.

SOLA ELECTRIC



DIVISION OF SOLA BASIC INDUSTRIES

DON'T STAND PAT ON OUR MINICOMPUTER SUPPLEMENT!



If you deal in minis, miniperipherals, or minisoftware, you've got a stake in Computerworld's July Supplement on the minicomputer.

We'll be laying all the cards on the table, identifying the so-called "minicomputer invasion" and what it means to your customers. We'll also be setting the records straight on important questions concerning minicomputer costs, machine selections, applications, and trends.

Show us your hand by sending your product information, no later than July 1st, to:

Don Strong
CW Supplement Editor
Computerworld
797 Washington St.
Newton, Mass. 02160



Cmdr. Hopper Honored

Former First Lady Mamie Eisenhower (left), congratulates Cmdr. Grace M. Hopper, U.S. Navy (Retired), after she was presented with the Science Achievement Award by the American Mothers Committee in New York.

Thirty-five women, distinguished in the fields of art, theatre, letters, medicine, and business were also honored at the recent awards luncheon held in the Waldorf-Astoria Hotel.

Cmdr. Hopper, currently on special leave from Univac, is serving as director, U.S. Navy programming languages, planning and development, in Washington, D.C.

She has received numerous awards during her outstanding career in computer technology including the Computer Sciences "Man-of-the-Year" award last year by the Data Processing Management Association.

Merger-Minded Companies Could Find Their Cupid in 'Blind Date' Introduction

By Harvey Elman
CW Staff Writer

DALLAS — Companies with an urge to merge but without the resources to find compatible and willing prospects could find "Cupid" in a two-year-old firm here.

Corporate Synergy Technology (Cosyte), a subsidiary of Mustang Computing Inc., is addressed to the problem of "how companies can find each other for a growth situation," according to Ralph Iredell, general manager.

The introduction of the interested companies is "something like a blind date, because their identities remain anonymous," he said. An inquirer can learn all he needs to know about a potential seller or acquirer without

knowing the identity of his specific location other than by a zone area, said Iredell. "Not even the computer technicians know the identity of the confidential source."

Everything to Lose

"If a company is up for sale and this information leaks out, then bank connections may be severed and key personnel may leave," he said, "so that the seller has everything to lose." Cosyte counts approximately 2,700 sellers of its 3,600 total companies on file.

"Our firm," he continued, "is a clearinghouse for detailed, confidential, and anonymous information about industries and businesses, worldwide (3% international). Bankers, stockbrokers, attorneys, accountants, and others concerned with acquisition, sale, and merging of firms will also benefit from such data."

Cosyte sends a checklist to prospective clients to form a two-part synergy report — current comprehensive profile and future desires.

Products, Status

Questions are asked in the following areas: products, status, diversification, marketing capability, annual sales volume, administrative management, quality, three-year "track record," seasonableness, and earnings reports.

The answers are fed into the

'Jets' Credit Card Encoding Plan Gives Instant Air Ticket-Vending

By Edward J. Bride
CW Staff Writer

BOSTON — A small but growing company in nearby Natick has developed the unique card-encoding technique that is the backbone of American Airlines' latest computer-customer experiment.

Synergistics, Inc. has created a process of encoding credit cards so they can be read by a computer input device. The device activates a ticket-issuing machine and records the transaction for computerized billing.

American Airlines introduced the system this month at Logan International Airport here. Called the Jet Express Ticketing System (Jets), it will be used for automatic ticket-vending for travelers on the airline's Boston to New York and New York to Washington express flights.

Similar to the Penn Central Railroad's vending machine, Jets issues tickets for the next flight only, and for one-way trips.

The experiment, which will run "at least three months" according to American officials, is the opposite end of the sophistica-

tion spectrum from a recently concluded test at Chicago's O'Hare airport.

The Chicago test involved a much more complicated machine and made available round-trips on various flights.

Encoding the Card

The encoding process is called Synchron, and involves indenting magnetically sensitive (ferrite) material into the plastic card so that the card and the binary code become inseparable.

The Jets equipment reads the code, checks a "blacklist" for lost or stolen cards, then issues the ticket if the traveler has a reservation. The process takes from three to 10 seconds.

The nonreservation passenger is told to "push button for class of travel," is given an indication as to availability of his preference, and is then told to "remove card to receive ticket."

If his preferred mode of travel is not available, he can choose the alternate, or could see the ticket agent to place his name on a waiting list.

Should the card be blacklisted, there are no whistles or bells. The traveler is told, by lighted sign, to "remove card and see agent."

When issued, the ticket includes two sections: the ticket and the airline boarding pass.

Thus, there is no checking-in, no waiting line.

Three Advantages

William M. Tetrick, chairman of Synergistics, said Synchron has three advantages over the other 20-odd encoding techniques for credit cards:

- Security — the ferrite imprinting is permanent, unaffected by magnetic fields, is virtually indestructible with normal use, and is extremely difficult to change.
- Cost — imprinting and reading devices are cheap, Tetrick added, without offering actual prices.
- Adequacy — the binary

code, on the back side of regular credit cards, contains more information than regular credit card numbers (the name of the card holder becomes part of the code, for example).

The Chicago test involved equipment developed by IBM, and was designed to communicate with American's Sabre system, also designed by IBM.

The Jets test, which is taking place in Boston, New York's LaGuardia and Washington's National airports, uses Honeywell minicomputers. The DDP-416 is used in Boston and Washington, a 516 in New York.

If the test is successful, as the Chicago test was, airline officials speculated that larger regional computers might be used instead of the stand-alone minis at each airport.

Rodney W. King, American's assistant vice-president for ground passenger services, said that 150,000 of the airline's new vacation credit cards are being Synchron-encoded and issued to card holders who fly frequently between New York and Boston or Washington.

System to Expand

King said that eventually this "relatively simple" machine might be expanded to include choices between window or aisle seats, or cash or credit transactions.

He said the system would offer round trip tickets before the end of the year, and that passengers would have the option of buying from the vending machine or the ticket agent at the departure lounge. The agent has a manual device which is used to keep the seat inventory up to date.

King played a key role in developing the Magnetrone Reservisor system, introduced by American in 1952, as "the world's first fully automated reservations device" and the first use of the digital computer in a commercial inventory problem.

IBM Unit Extends T/S Services

NEW YORK — Service Bureau Corp., a subsidiary of IBM, is extending its time-shared computer services to provide national as well as regional access.

The new service permits customers in eight U.S. cities to hook up with an IBM national center in Cleveland. This method allows a user with scattered plants and offices to connect him to a single CPU.

The only increase from existing charges for time-sharing services is in the hourly charge for connection to the CPU. The cost will rise to \$13.80 from \$11.

Humble to Put 80% of Oil Fields Under Computer Control by 1973

NEW YORK — Humble Oil & Refining Co., chief domestic subsidiary of Standard Oil Co. (New Jersey) and the nation's largest oil producer, will place fields containing 80% of its oil reserves under computer control by the end of 1973.

Humble said the \$50 million total automation system will apply to 61 oil and gas fields in Texas, Oklahoma, and Louisiana, as well as Southeastern areas of the country. Currently, six oil fields are under the control of the IBM 1800.

In its annual survey last December, the Oil & Gas Journal, a trade publication, reported that oil companies worldwide were using 54 computers to control oil production, 125 to con-

trol pipelines, 181 to control refining, and 315 to control petrochemical operations.

The new computer-communications system will provide 24-hour surveillance and control of production in the 61 fields from four computer centers in Midland, Corpus Christi, and Houston, Texas, and in New Orleans.

Areas such as status, alarms, and oil, water, and gas production will be closely supervised. A Humble official said the system will reduce production personnel requirements, resulting in switching of some workers.

J.C. Postgate, Humble's vice-president of production, said that the automation move will aid production efficiency,

CMC Establishes Subsidiary in France

LOS ANGELES — Computer Machinery Corp. has established a new subsidiary, CMC France S.A., to manufacture and market CMC's keyprocessing system for delivery throughout France.

The new subsidiary has received three orders for keyprocessing systems totaling more than \$620,000.

Other New Subsidiaries

★ Infodata Systems Inc. of Webster, N.Y., has formed an international subsidiary to market its computer software products and services in Europe.

The subsidiary will be called Infodata Systems International Inc.

The first objective of the new subsidiary will be to market Inquire, the company's computerized informational storage and retrieval software system in West Germany, Austria, and Switzerland.

★ A new firm, Construction Data Systems Inc., has been formed in Dallas to apply computer technology to provide totally integrated management information systems for contractors.

★ The Commonwealth Life Insurance Co. of Louisville and 14 other life insurance companies have formed Insurance Systems of America, Inc., to market computer-related services to the insurance industry. Headquarters will be in Atlanta.

★ Recognition Technology Inc. has been formed in Dallas to specialize in automated computer data input.

Technology service will also offer systems and programming, forms design, typing for the scanner if desired, and computer processing if clients need it.



COMPUTERWORLD

emerging enterprises

Intertel Supplies Integral Modems To OEMs for Its Initial Product Line

BURLINGTON, Mass. — Intertel, Inc. has been formed as a supplier of data communications products. The firm's initial product line includes standard and custom configured integral modems for original equipment

manufacturers.

Current products are the IN103 and IN202 which offer Bell System compatible 103 and 202 operation over direct distance dial or private lines.

★ Management Science Consultants, Inc., a Houston-based firm, has been formed to work on solutions to pollution, traffic control, and waste disposal difficulties facing major U.S. urban areas.

Using analysis techniques with the aid of computer technology, Management Science Consultants will take problems, qualify them thoroughly, prepare mathematical models, simulate alternatives to arrive at practical solutions in terms of time, energy and cost.

★ A new computer manufacturing firm, Modular Systems, Inc., has been founded in Fort Lauderdale, Fla.

Modular Computer Systems will market complete systems for real-time, on-line data acquisition, control, and communications.

★ Command Systems Corp. has been formed in Arlington, Texas, to specialize in development of custom computer systems.

The firm will operate as a jointly held subsidiary of Kordell Inc. of Arlington and Radiation Research Associates Inc. of Fort Worth.

★ Nortronics Company, Inc., Golden Valley, Minn., manufacturer of magnetic recording heads, has created two new divisions.

The European Operations and Magnetic Head Operations Divisions complete a major organizational change that began last winter with the formation of the Precision Head Operation Division.

★ A Univac marketing organization has been formed to handle sales and service of Univac computing systems in South Africa.

Known as the Univac Division of Sperry Rand South Africa (Pty.) Ltd., the new company will be headquartered in Johannesburg.

SAVE 30%

LEASE S/360

Available

75, 67, 65, 50, 40, 30, 20,

LOWEST PRICES • MCST FAVORABLE TERMS

Available Separately
on short term lease

2314-1 DASD • 2401-6 Tapes • 2311-1 Disks

Contact: B. Gest, Pres.

COMPUTER MARKETING ASSOC.

20 Parkview Road, Cheltenham, Pa. 19102

Tel: (215) 635-6112

WE PURCHASE 360 EQUIPMENT

The Computer Industry in the 1970s

During 1969, U.S. companies chalked up over \$10 billion in revenues from their computer industry activities... ten times the corresponding figure for 1960. In 1974, revenues of some \$25 billion are expected.

That's how EDP Industry Report describes the decade just past in its special Review and Forecast issue, just published.

This Review and Forecast issue contains a revenue history and projection for the key sectors of the EDP industry... five-year shipment projections... and capsule analyses of IBM and the other major computer manufacturers.

This one issue will go a long way toward bringing you up to date on the computer industry. It is one of the twenty-four issues published throughout the year and is available for \$10, or as a free bonus with your subscription — \$75 per year. Write:

EIDIP industry report

Department RF
60 Austin Street
Newtonville, Mass. 02160
617-969-4020

We speak the language... fluently.

Cobol

Programming Course

July 20-31, 1970

Objective:

To establish competence in programming using the COBOL language.

Prerequisites:

A familiarity with programming and computer hardware and software systems.

This intensive instruction covers all features of COBOL. The student is guided in the coding, de-bugging and testing of many business-oriented problems. His capability is developed and tested. Upon completion of this ten-day course the student will be equipped to independently construct COBOL programs.

Computer Educational Services takes your selected personnel and indoctrinates them with important programming techniques such as the logic necessary for file maintenance. They learn by doing with actual case problems.

This is the most comprehensive and functional course of its kind available to industry. For enrollment call, write or mail coupon.

Computer Educational Services

The Equitable Building/100 Peachtree Street
Atlanta, Ga. 30303...404/522-7214

Please send enrollment information

Name _____

Company and title _____

Address _____

City _____ State _____ Zip _____

WE DON'T SELL OS/360 — WE JUST TEACH IT... WHEREVER YOU CHOOSE!

It's our job to train your staff in both the limitations and strengths of OS/360. We offer 58 courses and teach at your location and/or ours. If it's an OS/360 subject, we cover it and we would like the chance to do just that for you. Give us a call.

PROGRAMMING • ANALYSIS

PACE

CONSULTING • EDUCATION

For OS/360 training call or write:

PACE Computing Corporation/Penthouse/Architect Building/1400 Wilson Boulevard/Arlington, Virginia 22209/(703) 527-4810

Contracts

A \$5-million contract calling for the implementation and management of a computerized information retrieval system designed to serve the automotive parts distribution industry has been awarded by Computer Catalogs, Inc., Boston, to Moll Associates, Inc., Watertown, Mass. The system, called "Compulog," is an on-line, real-time information storage and retrieval system designed to fill the need for total information in the auto parts industry.

An initial production contract in excess of \$500,000 to produce air data computers for use aboard the supersonic Firebee II Drone has been awarded to Contrac Corp.'s New Jersey Division by Teledyne-Ryan Aeronautical Co.

Computer Sciences Corp. has received a contract to provide extensive services in systems analysis and computer programming to Nasa's Goddard Space Flight Center at Greenbelt, Md. CSC will support this function by providing systems analysis and computer programming for theoretical and analytical studies of satellite attitude determination and orbit determination.

The Airline Division of Computer Communications Network has signed an agreement to furnish Philadelphia-based Altair Airlines with a computerized reservations system. Terms of

the contract were not disclosed.

Infoton, Inc., Burlington, Mass., has contracted to purchase \$3.2 million in components for its cathode ray tube display terminals from National Semiconductor Co., Inc.

Astrodata, Inc., Anaheim, Calif., received a \$889,000 contract from the State of California Department of Water Resources for a supervisory control system. The system will control the starting and stopping of 14 pumping units, each rated at 80,000 horsepower, and the opening and closing of two 14-ft diameter butterfly control valves approximately 1-1/2 miles from the pumping plant.

Astrodata, Inc., has received a contract from the U.S. Army Corps of Engineers, for a supervisory control system. The contract, valued at just under \$400,000, calls for the delivery of a SCS with central processor, three remote data loggers, one remote control console and associated communication equipment with systems engineering and software to insure overall system performance.

Scientific Resources Corp., Philadelphia, has signed an initial contract for \$500,000 by a subsidiary, Mauchly-Wood Systems Corp., Los Angeles, with the city of Long Beach, Calif., for the development of a computerized

public safety subsystem.

Vogue Instrument Corp. has been awarded a production contract for high speed digital printers from the Department of the Air Force, San Antonio Air Materiel Area, Kelly Air Force Base, in the amount of \$164,385. These printers are to be installed as part of the Minute Man Value Analysis Test Equipment (Vate) System.

World Systems Laboratories, Inc., Bethesda, Md., has been awarded a \$24,000 contract for designing and implementing a computerized fund accounting system for the Allegheny County, Pa., controllers' office.

United Computing Systems, Inc. and McGraw-Hill Book Co. have signed an exclusive contract under which UC, a subsidiary of United Utilities, Inc., will program a number of MG-H technical publications. The information in such reference works will be stored in the memory bank of United's computer in Kansas City, accessible to hundreds of simultaneous users by means of multiplexed telephone circuitry.

Buy Sell Swap

WANTED

USED PDP-8 OR OTHER SMALL COMPUTER, MOD-ESTLY PRICED FOR MOD-EST INSTALLATION, MINIMUM AMOUNT OF CORE AND PERIPHERALS, 4K and 32 ASR

201-254-0050

SERVICE

SPECIALIZING IN IBM D.P. EQUIPMENT
• MAINTENANCE-PERCALL & M.A.
• RECONDITIONING & REFINISHING
• MACHINE UPGRADING
• CONSULTING & INSPECTIONS
• CONTROL PANEL WIRING
UNIT RECORD SERVICE CO.
P.O. BOX 182
CAMBRIDGE, MASS.
(617) 876-2400.

ACS

WANTED

360 Models 30, 40, 50 and Peripherals
1401-8, 12, or 16K Tape or Disc Systems

SALE OR LEASE

12K 1460 with 1100 LPM Printer
32 and 64K Model 30's
029's, 084, and 088-1

ACS Equipment Corporation
8928 Spring Branch Drive
Houston, Texas 77055 (713) 366-1001

FOR SALE OR RENTAL ON IBM M/A

IBM 024, 026, 029, 056, 059, 077, 085, 519, 548, 082, 403, 407
(212) 673-9300 x10

I.O.A. DATA CORPORATION
383 Lafayette Street
NYC 10003

FOR SALE

64K Word Disk

for
DEC PDP-8/I Computer
DF 32 unit - Disk File and Control (32K words)
DS 32 unit - Expander Disk File (32K words)

Write or call J. Hayes
United Computing Corporation
22500 So. Avalon Blvd.
Carson, Calif. 90744
(213) 830-7720

WANTED TO BUY

360/30 32K
3 2311'S
PRINTER

CARD READ/PUNCH

Send details (including price and availability) to:

CW Box 3208
60 Austin Street
Newton, Mass. 02160

WANTED

IMMEDIATELY

To BUY or LEASE

IBM/ 360/65
360-67

Principles:

MARKETTIME
CORPORATION
2 PENN PLAZA NYC 10001
(212) 736-2430

IBM 360 EQUIPMENT AVAILABLE FOR LEASE

Model 30's/16K-32K-64K
Model 20's/C2-D2

IBM TAPE DRIVES 2401
Model 2, Model 3, Model 6
IBM TAPE & DISC CONTROLS
Models 2403, 2803, 2841

IBM DISC DRIVES
Model 2311

IBM COMMUNICATION CONTROL UNITS
Model 2701 & 2702
PRINCIPALS ONLY

For Model 50 See Page 37

PLEASE CALL COLLECT:

JOHN PUTTRE
(914) 428-5000

FOR SALE

ANY REASONABLE OFFER!

12 Memorex Mark VI Disk Packs
14 Potter HSP-3502 Line Printers
8 Potter FC-1060 Tape Drives
4 Tektronix 547 Oscilloscopes
3 Hewlett Packard 180A Oscilloscopes
2 Vermont Research VT-2032 Drums

Plus

Large supplies of DEC logic modules and parts and GDI card reader parts
If you're interested in any of this equipment, phone this number toll free:

800-558-8709

IBM For Sale

083 - Sorters
557-1 - Interpreter
On IBM Maintenance
Immediate Delivery

Mr. S. Green
32 N. Clinton, Chicago
(312) 829-7300

WANT TO BUY

IBM 6405 With
Distribution Memory

Write or Call:
Ed Brown
800 Southwestern Ave.
Oklahoma City, Oklahoma 73125
(405) 232-2461

COMERICA COMERICA NOW BUYING

• 1401 Systems
• 082 Sorters
• 402 Tabs
• 047 Converters
AND SELLING
• 360/30 65K System
• 2540-1, 1403-N1, 2821-2

Contact:
Bill Oliver (816) 221-0202

OR WRITE:
COMERICA

COMERICA COMERICA

Trade Shorts

UCC's Systems Support Division (SSD), Dallas, has agreed with the Wyle Computer Products Division of Wyle Laboratories to maintain the division's computer related products, announced SSD President Edward F. Kearns.

The Air Force has approved resumption of Burroughs B3500 system deliveries under the Phase II Base Level Data Automation Standardization Program.

Metro Data Systems Inc., Oklahoma City, Okla., has been re-

named LVO Data Systems to reflect the company's recent merger with LVO Corp.

Cybernetics International Corp., New York, a diversified services company, has placed increased emphasis on peripherals, expecting to become a larger supplier of advanced key-to-disk data entry systems.

RCA's Computer Systems Division has established a new sales office in Columbia, S.C., to market and service Spectra 70 systems.

360 INTERFACE PROBLEMS?

The Capital CAM/360-2 Channel Access Module simplifies the task of attaching any 8- or 16-bit parallel device to any channel of any 360, models 30 to 195. Speeds to 1 Megabyte. For information, write or call

CAPITAL COMPUTER CORPORATION
18 Mackoil Dayton, O. 45403
(513) 253-6622

AgriBusiness Opportunity

Exclusive State licenses available for the AgData Agriculture and AgriBusiness computer programs. Covers all management, financial and payroll accounting. Copyrighted input package included.

Write: AgData, Inc.
P.O. Box 1077
Davis, Calif. 95616

ACCOUNTS PAYABLE \$5800

COBOL, 16K, 4 MTU'S, C/R, C/P, Printer

- Edit List & Batch Analysis
- Vendor Maintenance Register
- Invoice Register
- Cash Requirements
- Checks
- Check Register
- Check History
- YTD Purchase Analysis
- Open Item Register
- Reconciled Check Listing
- Unreconciled Check Listing
- Distribution Report

For further information, please contact:

THE COMPUTER GENERATION INC.
PRESIDENTIAL PARK 3781 NORTHEAST EXPRESSWAY, SUITE 10
ATLANTA, GEORGIA 30340 (404) 458-3371

Buy Sell Swap

Honeywell 120 For Sale

\$125,000 24K, 4 Tapes
Printer Reader/Punch
Carlin-Black-Systems
Corporation
3376 Peachtree Road
Atlanta, Georgia 30326
404-261-2036

BUY-SELL-LEASE

ALL TYPES
DATA
PROCESSING
EQUIPMENT
COMPUTER DISCOUNT CORP.
2400 E. Devon Ave.
Des Plaines, Ill. 60018
(312) 297-3640

360-30 SALE

360-30-32K
65% of IBM Price
360-30-65K
65% of IBM Price
360-30-65K
System with disks,
printer, etc.
70% of IBM Price

Data Equipment And Supplies, Inc.

5738 N. Central Ex.
Suite 101
Dallas, Texas 75206
214-827-4591

IBM SALE

024-\$600; 026-\$1800; 056-\$650
077-\$900; 082-\$1000; 083-\$3800
084-\$7500; 108-\$7500; 402-\$2000
403-\$2500; 407-\$7000; 514-\$1900
519-\$2200; 523-\$1100; 632-\$2500
1316 Disk Packs \$150;
2311-\$14,000; 1620/22-\$15,000;
6400-\$14,000
1401/1402-\$24,000

AALL DATA CO.
105 Hinricher
Willow Springs, Ill.
312-839-5164

SOFTWARE SPECIALISTS

Computer programs are worth cash to the programmer/analyst who has developed a reliable system which is debugged and ready for the market place.

In the last 6 months our company sold 68 packages, worth more than \$250,000 to major companies from coast to coast.

If you have software which can be marketed we will compensate you handsomely.

Call or write for details of our plan.

D.G. Webster, President

Webster Computer Corporation

1 Padanaram Road
Danbury, Connecticut 06810
(203) 744-6500

FOR SALE OR LEASE

360/30
1406 II
1401's
7010-1410
2311
1440
729's

CORPORATE
COMPUTERS, INC.
120 East 23rd Street
New York, N.Y. 10010
(212) 867-0664

Time for Sale

NEW JERSEY

PDP-10 Time Sharing

Fortran, Aid, Basic,
Minicomputer Simulation

Call Joel Pratt
609-921-8550

Applied Data Research Inc

COMPUTER TIME AVAILABLE

NORTH JERSEY & CONNECTICUT

IBM S/360-20
IBM S/360-25
IBM S/360-30
IBM S/360-40

OFF LINE PRINTING
(ALL FONTS)

EXCELLENT PRICES
TIME AVAILABLE
ON ALL SHIFTS
SPECIAL RATES
FOR W/E TIME
CALL: L. NELSON
201-471-4300

ILLINOIS



Open 24 hrs a day
7 days a week
CHICAGO LOOP

Guaranteed Prime Time

FOUR SYSTEMS

360/30 65K
6 Tapes 4-2311's
360/40 131K
6 Tapes 5-2311
360/40 131K
6 Tapes
2314 A01

Standard IC-6000 with
micro programming
1401/1410/7010:
7044/7094 DOS —
OS—CS/30 CS/40
DATANAMICS
624 S. Michigan
Chicago, Ill. 60605
(312)939-1323
VOLUME DISCOUNTS

IBM 360-40
1401 1410 Compatibility
OS DOS
Key Punching - Programming
COMPUTIME OF CHICAGO
209 WEST JACKSON BLVD
CHICAGO ILL 312 922 6624

360-30 65K

ALL SHIFTS

CHICAGO AREA

Ken Stapley
312/654-4262

MASSACHUSETTS

PRIME SHIFT 360/40

131K — Fast I/O
7 Tape, 3 Disk
\$65 — \$90/hour
ALSO
Printing, QN, SN, TN
\$18.50 — \$35
STUDY CUBICLES TOO
Will Daugherty, Information Services
Inc., Babson Park, Wellesley, Mass.
(617) 235-4755

PENNSYLVANIA

COMPUTER TIME AVAILABLE

Prime Shift
King of Prussia
Industrial Park
Philadelphia, Pa. Area
IBM 360/40 256K
4 Tapes 8 Drive 2314
OS MFT Available

Contact: William S. Page
(215) 265-7744

NEW YORK

3rd SHIFT AND WEEKENDS

IBM 360/40

256K OS/DOS

\$45/HR.

CALL (212) 475-1830
ASK FOR TOM MOODY
DYNAX RESOURCES, INC.

WHO SAYS PEOPLE DON'T
READ CLASSIFIED ADS!

COMPUTER ACQUISITIONS CO.

WANTS

COMPUTERS, ALL
MAKES
UNIT RECORD
EQUIPMENT

(404) 458-4425 • BOX 29185
ATLANTA, GA. 30329

Software for Sale

CDC TO IBM FORTRAN AUTOMATIC CONVERSION

Translates CDC programs into a
standard Fortran for 360, IBSYS
etc at a cost of only 10 cents/
card.

SOFTWARE STANDARDS

4401 Keswick Road
Baltimore, Md. 21210
301-235-2250

360 TELEPROCESSING/ CONTROL PROGRAM DOS — OS

An On-Line Control Program which
provides you with:
• Terminal and Line Control Support
• Multi-Tasks Application
• Interfaces with ALC & COBOL
Application Programs
• Audit File
• System Recovery
This system is currently in use and
has proven to be highly successful.

Automated Financial Systems
Incorporated
One Decker Square
Bala Cynwyd, Pa. 19004

FINANCIAL PACKAGES

Certificates of Deposit
Demand Deposit Accounting
Credit Union Accounting



ALL FOR
DOS360 32K

Financial Systems Consultants

P.O. BOX 1204 / FORT WAYNE, INDIANA 46801
Telephone: 219 / 422 5415

*** BACK-UP ***

BACK-UP is a set of two programs
that provide disk-tape dump/restore
facilities for DOS users. Both pro-
grams are completely relocatable, and
can run in any or all partitions. They
require only 6K of core storage to
back-up and restore any 2311 disk.
They can be modified to handle
2314's with very little effort. They
require less tape and run slightly
faster than IBM's standard dump/re-
store utility, although both of these
may vary slightly depending on the
amount and size of data. BACK-UP is
unique in its extremely small core
requirement, and may be purchased
for \$200.00. Purchase price includes
all necessary documentation.

Contact: Bill Bricking

AMERICAN COMPUTER
LEASING CORP.
ONE EAST 4th STREET
CINCINNATI, OHIO 45202
(513) 579-2211

ACCOUNTS PAYABLE

COBOL (Disc/Tape)

- Excellent cash management capability
- Handles multi-division companies with only two easy-to-use input forms
- \$6,000 or \$200/month



URS DATA SCIENCES CO.
1700 South El Camino Real
San Mateo, Ca. 94402
(415) 349-5111



We pay
System/360 users
100 percent
compounded

Incredible? Not when they use Boole & Babbage SMS/360™ — the first commercially available software that measures IBM 360 hardware and program performance.

In a typical installation, SMS/360 routinely reduces System/360 program run-time 20 to 30 percent. It often saves enough to pay for itself during the first week. From then on savings compound as SMS/360 continues measuring performance — providing the data and analysis needed to get maximum output per dollar invested in the IBM 360. SMS/360 is available for OS and DOS.

With unbundling, the need to reduce operating costs is more pressing than ever. Boole & Babbage SMS/360 is the tool you need. It is available now for immediate purchase, installation and fast employee takeover.

For information contact:
Boole & Babbage Inc.
1121 San Antonio Road, Palo Alto, Ca. 94303
(415) 961-4440

084 047 088 FOR LEASE — AVAILABLE IMMED. NATIONWIDE DELIVERY UNDER IBM M/A

We are buying unit
record equipment

Data Rentals
3753 Wilshire Blvd.
Los Angeles, Calif.
(213) 385-2484

FOR SALE AT FRACTION OF ORIGINAL COST

IBM 360 Systems, 7074,
7094, 1401, Univac Systems

EBM COMPANY

625 Bard Ave.
Staten Island, N.Y. 10310
212-273-3636

NEED A SMALLER UNIT?

NCR — 500 (400 words) —
New Aug. 68 —
Used Very Little —
W. Va. Loc. \$25M


CW BOX 3205
60 Austin Street
Newton, Mass. 02160

SALE

Sanders Data
Display Equipment

(2) 720 Display Terminals
(1) 701 Control Unit
Used only on a test basis
Will Sell June 15
For Highest Offer Received

TELECOMPUTING
INCORPORATED
1626 EDISON STREET
DALLAS, TEXAS 75207
(214) 748-0751



Management and DP Personnel both benefit from **GENERAL RETRIEVAL SYSTEM** and **GENERAL MAINTENANCE SYSTEM** hundreds of users' names on request

call or write
Information Science Incorporated
New City, Rockland County
New York 10956
(914) 634-8877

Don't Install 2260's
(or any other key-driven terminal)
without **GRAPHICS**
a complete software package

turnkey systems inc.
one eleven east avenue
Norwalk, Connecticut 06851
(203) 838-4581

Information Retrieval and File Maintenance

On-line, high-speed.

On-Line Retrievals: Use and, or, not, etc. to compose requests. Answers provided instantly.

On-Line File Maintenance: Change existing records, add new records, directly from on-line terminal.

Variable-Length Records: All records consist of a variable number of variable-length fields.

Display Terminal: Use IBM 2260 display terminals. Other terminals also supported.

Easy to Learn: Non-programmers can learn to use the system in a few minutes.

On-Line Format Specification: Display only the information you really want to see.

Cross Reference: Several files may be stored and cross referenced directly from terminal.

Cross Tabs: Cross tabs and other reports may be requested from terminal.

All of this is available from Computer Corporation of America in 2 models: Model 103 for IBM 360/DOS and Model 104 for IBM 360/OS.

Write us for information. And specify which model you're interested in. And if you're interested in the batch-processing mode of operation, specify that, too.

Our address is Technology Square, Cambridge, Massachusetts 02139.

Computer Corporation of America

Software for Sale

infomacs

The incredible new report generator and file creator that revolutionizes report writing and live test file generation.

Load and Go Environment

DISK-TAPE

- Sequential/Isam Variable/Fixed
- Control card language
- Learned in minutes
- 70% fewer cards than RPG
- Output—Edited Report—File
- Process—Entire file—Selective records

Create selective test file from live data file

- Maximizes testing environment
- Reduces test time

One-Time Reporting

- Produce report instantly
- No more special programming projects

Write for new 1970 technical data and operating instructions, free demonstration and pricing information.

mocs

104 Park Towne Place East
Philadelphia, Pa. 19130
215/LO 8-6860

datamacs

The incredible new test data generator that completely revolutionizes the normal procedure of creating test data.

Load and Go Environment

Creates all types of files

DISK

- Sequential
- Index Sequential

TAPE

- Variable
- Fixed

Data generated for each field

- Constant-specific values
- Sequential values
- Random numbers
- Clusters
- Computational
- Mix—All of the above

Write for new 1970 technical data and operating instructions, free demonstration and pricing information.

mocs

104 Park Towne Place East
Philadelphia, Pa. 19130
215 LO 8-6860

360 Payroll System — 100% COBOL —

Series of 23 programs which process hourly and salaried payrolls in a multi-company environment. Liberal deduction capabilities. Full labor distribution reporting. Complete file maintenance facilities. Excellent documentation. Runs on IBM 360 with 32K and two 2311 Disk Drives. This system is now being used and has proven highly successful.

PRICE: \$ 5,000.

Automated Financial Systems Incorporated
One Decker Square
Bala Cynwyd, Pa. 19004

PAYROLL/PERSONNEL ACCOUNTS PAYABLE DOCUMENTATION SYSTEM TEXT EDITOR SYSTEM

Modular/Well-written
Standard 360 COBOL
Easily Maintained
Customized
DOS/OS

PACKAGE SYSTEMS

References
90-Day Guarantee
Implemented/Tested
Modification Services
Complete Documentation

For details contact:
COMM-SCI SYSTEMS CORP.
785 Market Street
San Francisco, Calif. 94103
(415) 392-5379

* ACCOUNTS PAYABLE

* GENERAL LEDGER

* ACCOUNTS RECEIVABLE

* JOB COST



MANUFACTURING MANAGEMENT SCIENCES, INC.

- S/360 — 25 AND UP
- ALL INSTALLED
- WE IMPLEMENT AND MAINTAIN
- WE GUARANTEE

MANUFACTURING MANAGEMENT SCIENCES, INC.
279 CAMBRIDGE ST.
BURLINGTON, MASS.
617-272-2970

UNIVAC 1108 BDP Breakthrough!
File Management System for Tape
File Creation, Updating and Reporting
Designed & Implemented by COBOL Experts:
SEIDEL COMPUTER ASSOCIATES
8949 Reseda Blvd. Suite 107
Northridge, Calif. 91324
(213) 349-1345

MARGEN™

RCC's Management Report GENERator. Selects, integrates, coordinates data from your existing files into simple, easy-to-read reports in hours, not days!

MARGEN

Satisfies the need for one-time or non-repetitive reports. Shows dramatic time savings on cross-tabulated reports!

MARGEN

For use on IBM and RCA systems. Does not require the creation of intermediate files—any standard file which can be read sequentially can be used with MARGEN!

MARGEN

Easy to use. Even non-DP people can use it. Just lay out the report, punch your program directly from the report form, load and go!

MARGEN

If you're evaluating software programs, write for literature. If your need is immediate, get your decision-makers together and phone right now for an on-site demo. MARGEN will prove itself.

RCC

RANDOLPH COMPUTER CORPORATION

1425 East McMillan St.,
Cincinnati, O. 45206
(513) 961-5400
Offices in principal cities

6K COBOL CROSS-REFERENCE

Now available to 360 DOS users: a 6K COBOL CROSS-REFERENCE that provides a sequential listing of all data-name and literal usage. This program uses a maximum of 25 cylinders of a 2311 or 2314 to handle up to 9,375 entries, approximately 7,500 to 10,000 source cards. Execution time is extremely fast. 6K storage requirement includes foreground save area. Nothing like it.

Price: \$200.00

Call or write:

AMERICAN COMPUTER LEASING
ONE EAST FOURTH STREET
CINCINNATI, OHIO 45202
(513) 579-2211

1130 PLOT

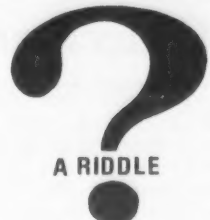
Low cost system plots up to four curves per graph on console type-writer. Special typehead includes 15 dots and 15 crosses positioned in a 3 x 5 raster which yields a plotting precision of about one-thirtieth inch.

- Automatic Scaling and Grid Lines
- Optional Titles and Legend
- Red and Black Points

Call or Write:

TPLOT, Inc.
55 Mitchell Blvd.
San Rafael
California 94903
(415) 472-2211

WHO SAYS PEOPLE DON'T READ CLASSIFIED ADS!



A RIDDLE

What do flow charts, cross-reference listing aids, and pearl handled buggy whips all have in common.

They all help get more mileage out of the workhorse, and they are all obsolete.

WHY?

COBOL-MAP is now available and costs only \$199.95 (15 day free trial too). COBOL-MAP says on one listing what others spew forth in reams—if they spew at all.

For complete description write

PIONEER DATA SCIENCES, INC.
P.O. Box 236
Wilbraham, Mass. 01095
(413-732-9613)

INTRODUCING 1130 NOWPOWER

Now, no more waiting for a slow program to finish before you run a quickie. **1130 NOWPOWER**, an exclusive innovation from DMD, lets you interrupt any job—run another—then automatically restores and resumes your original program. Does it economically, too.

Available immediately.
Write Us. Or Phone:
312-748 2900

DMD

data for management decisions inc.

22335 Governors Hwy.
RICHTON PARK, ILL. 60971

UPTIME FILE MANAGEMENT AND REPORT GENERATOR

Write reports in minutes, create and update any file using a simple, but powerful free-form English language. 25 times faster than COBOL. Currently operational IBM 360, Univac, RCA. Price \$3000.00

PAYROLL

Multi-branch, hourly and salary, all state and local taxes, generates all corporate and government reports. Currently operational. Thoroughly documented in a clear cut manner. Available for IBM 360 and H-200.

Price \$6,000

AUTOMATED INFORMATION SYSTEMS, INC.

1 Washington Street
Wellesley Hills, Mass. 02181
(617) 237-3580

Reps in: Chicago, Denver, Minneapolis, Montreal and Omaha.

Orders and Installations

A computer-driven display system and closed circuit television portion of an automated flight simulator — that permits one instructor to train four helicopter pilots simultaneously — has been delivered to the Link Division of the Singer Co. by Sanders Associates, Inc., for Naval Training Device Center, Orlando, Fla.

Digital Equipment Corp.'s Typeset-8, based on DEC's PDP-8/L, has been installed in The Times of Hamilton, New Zealand. The computer's built-in dictionary of words and place names eliminates hyphenating decisions in the composing room.

Ampex Corp., Culver City, Calif., has received a \$1.1 million order from the Friden Divi-

sion of the Singer Co. to supply digital tape drives for the new Singer System Ten business computer.

Ashikaga Bank, headquartered in Utsunomiya, Japan, has ordered a Univac 418-III and associated peripheral equipment valued at \$5 million, which will serve as the heart of an on-line system connecting 84 branches. Univac 418-III systems have also been ordered by SITA (Société Internationale de Télécommunications Aeronautiques) for its computer center at Bohemia, Long Island, N.Y. A third order for the 418-III has come from Swedish Telecommunications Administration. The system will be used for public telegraph and meteorological message switching.

Control Logic Appoints O'Rourke a VP

BETHESDA, Md. — Control Logic Corp. has appointed Donald J. O'Rourke as vice-president of marketing.

O'Rourke has 20 years of marketing, technical, and executive experience in the computer and electronics industries.

Prior to joining Control Logic, O'Rourke was associated with RCA.

Holding an M.B.A. degree, O'Rourke serves as a member of the faculty of the Center for Technology of the American University.

Other Moves

Eugene W. Courtney has been promoted to vice-president and general manager of Digital Scientific Corp., Sorrento Valley, Calif.

Edward Driscoll has been

named vice-president of marketing by Transcom, Inc., Bloomington, Conn.

William E. Roberts, president and chief executive officer of Ampex Corp., will assume the chairmanship of the board of directors in addition to his present duties.

Executive Corner

William R. McDonald has been named a vice-president of Arcata National Corp., Menlo Park, Calif.

Bernard M. Goldsmith, chairman of the board of Nytronics Components Inc., has been elected to the post of

president of Nytronics, Inc., the parent company.

The following are three promotions at Cerebus Corp., Houston: John E. Stephens, senior vice-president, James L. Lenderman, vice-president/marketing, and Dewitt T. Baker, vice-president/systems and programming.

Numerax, Inc., Englewood Cliffs, N.J., has named Lester A. Probst executive vice-president.

Leonard J. Blumenthal has been appointed president of Chemistron Corp., Houston, a Sterling Electronics Corp. subsidiary.

Stanley R. Zegel has been named president of Iowa Data Processing Corp., Cedar Rapids, Iowa.

Richard J. Bonner has been named vice-president of Automation Technology, Inc., Santa Barbara, Calif.

Jerome C. Berning has been appointed president of Technical Computer Services Corp., Chicago.

Classified Information

Revealing a partial list of Computerworld Recruitment Advertisers:

Aetna Life & Casualty
Blue Cross-Blue Shield
Bunker Ramo
Caelus Memories
Chase Manhattan Bank
Datacraft
Digital Equipment
Hetra

Lockheed Missiles & Space
Martin Marietta
Memorex
National Cash Register
Ralston Purina
Sycor Inc.
United States Navy
Victor Comptometer

If you've ever wondered what media the Personnel Managers in other major companies use to find their computer people, now you know about Computerworld. And if your company's name isn't on our list, you're probably eager to find out how successful the other companies were in getting results. Especially the companies that are a lot like yours and need the same kind of people.

Sorry. That's classified information too long to include in this limited space. But we can tell you that the above companies have run a total of 11,942 lines of advertising in Computerworld during the first quarter of 1970.*

For further classified information that will guide you on how you should spend your advertising dollar (and how the other companies do) call the Computerworld Representative in your area or (617) 332-5606.

* Statistics compiled by Computerworld's Market Research Department.



COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Computerworld Sales Offices

National Sales Manager
Neal Wilder

Sales Administrator:
Dorothy Travis
COMPUTERWORLD
797 Washington Street
Newton, Mass. 02160
(617) 332-5606

New England Regional Manager
Robert Ziegel
COMPUTERWORLD
797 Washington Street
Newton, Mass. 02160
(617) 332-5606

Mid. Atlantic Regional Manager
Donald E. Fagan
COMPUTERWORLD
Suite 4C
120 East 34th Street
New York, N.Y. 10016
(212) 532-1790

Phila-Wash., D.C. District Mgr.
John Cummings
COMPUTERWORLD
Suite 510
2021 "L" Street, N.W.
Washington, D.C. 20036
(202) 466-2630

Midwest Regional Manager
Bill Farrell

Eastern Midwest District Manager
Joe Daniels
COMPUTERWORLD
Suite 21B
25 East Chestnut
Chicago, Illinois 60611
(312) 944-5885

Southeast Regional Manager
Ed Graham
COMPUTERWORLD
Stemmons Tower West
2730 Stemmons Freeway
Dallas, Texas 75207
(214) 638-1140

Los Angeles Area:
Bob Byrne
Sherwood/Byrne/Clarkson/
Vann & Assoc.
1017 N. LaCienega Blvd.
Los Angeles, Calif. 90069
(213) 657-6221
San Francisco Area:
Bill Healey
Thompson/Healey Assoc.
1111 Hearst Bldg.
San Francisco, Calif. 94103
(415) 362-8547

Even the price is Teletype replaceable!

Here, finally, is a CRT terminal you can cost-justify. \$88 per month!

It's the all-new, stand-alone, solid-state CRT display with features that anticipate tomorrow.

The Hazeltine 2000 is engineered, built and backed by the Company that's been pioneering progress in electronics since 1924, the Company whose reputation for engineering excellence, uncompromising quality and service is known and respected worldwide.

Standard Features

- Teletype Replaceable
- 1998 Character Display (74 characters per line; 27 lines)
 - Full or Half-Duplex Operation
 - Selectable Transmission Rates
- Powerful Editing Capability (Line and Character Insert/Delete)
 - Selective Roll-Up
 - 2048 x 8 Magnetic Core Memory
 - Cursor Addressability
 - Split Screen
- Solid State Keyboard May be Operated Remotely

Available as Options

- Instant Hard Copy Accessory
- Magnetic Tape Cassette Accessory

Contact us immediately for a demonstration or additional information.



Hazeltine 2000



Hazeltine Corporation

Industrial Products Division
Little Neck, New York 11362
(212) 423-4800

Hazeltine and the Pursuit of Excellence

ADVERTISEMENT

ACCOUNTS RECEIVABLE
PACKAGE SAVES TIME

ENCINO, Calif. — A multiple-client accounts receivable system economizes processing time by performing operations in one pass of the master file. The system also prints statements two-up and can be installed in one week by Computer Applied Systems Inc.

Designated Casars (CAS's Accounts Receivable System), the package provides automatic repeat invoicing, general ledger account totals, variable heading and trailing messages on statements, work-in-process accounting, and client combinations of open items and balance forward statements. All financial reports show aged balances. Four Cobol programs and two sorts comprise the total system.

Casars costs \$15,000. The system may be leased.

Computer Applied Systems Inc. is located at 18075 Ventura Blvd.

The Above Article Originally Appeared in Computerworld February 25, 1970.

Computerminal Cancels Burroughs Orders

By Harvey Elman
and Phyllis Huggins
CW Staff Writers

SAN FRANCISCO — Computerminal Inc., the firm that placed \$60 million dollars in orders for the Burroughs 5500 [CW, March 11] has failed to obtain financing, forcing termination of the contract.

Representing the largest commercial order reportedly placed outside of the U.S. Government, the contract called for 40 dual processor B5500s to be installed in 20 major U.S. cities.

A Burroughs spokesman said that order credit had not been placed for these systems, thus first quarter order levels would not be affected.

"The deal was cancelled because the capital markets are gone, forcing this industry to measure earnings performance," said Len Palmer, Computerminal president. "The industry is finally going to perform earnings or not at all. For fifteen years we've been going through cycles where as fast as any technology started to pay off, we went into another cycle with more investment demands."

"The investment public just gets tired of blue-sky talk and no earnings. Service bureaus will not rush to IBM's new system as

they have in the past," he continued.

"I have two efforts going, the large plan and the conventional bureau. We operate a B3500 and are doing \$650,000 a year and running a little black ink. I will concentrate on that until the

marketplace improves. Fellows like me have to take the profit attitude now you just can't project profits.

"If the industry can't make profits and stand on its own two feet, you wonder if it's necessary. Tight money can impose a

discipline that can be very beneficial to making this industry perform like a business. My larger plan is going to depend on the marketplace and it's my guess that the marketplace will not be the right climate for some time."

Acquisitions

Tracor Computing Corp. (TCC), Austin-based consulting and computing services company, has completed the pending acquisition of Computer Planning Corp. (CPC) and its wholly-owned subsidiary, On-Line Sciences, Inc. TCC has acquired, for stock, substantially all of the assets of CPC and On-Line Sciences.

Academy Computing Corp. disclosed that an agreement in principle has been reached with the management of Compute America Corp. (Comerica) where by Comerica would be merged into Academy. Both companies are headquartered in Oklahoma City. Comerica is a privately-held corporation operating in the batch-processing field as well as the marketing of computer hardware. Academy, a publicly-owned company whose stock is traded over-the-counter, is in the

computer time-sharing and software field. The merger with Comerica is subject to the approval of the directors and stockholders of both companies. The merger would provide the company with a nationwide computer network and put it in the top 10% of computer service companies in America in terms of annual sales.

Carci Computab Systems, Inc. has merged with Cybermatics Inc. of Fort Lee, N.J. Cybermatics will be issuing approximately 199,000 shares of common stock to effect the merger. Carci manufactures and sells continuous, single, and multi-copy business forms used in computer systems. Cybermatics is a publicly owned independent software company serving as a general systems contractor and supplier of on-line systems and computer-based services and

products.

Automatic Data Processing, Inc., a national computer services company, has reached an agreement in principle to acquire the Houston computer center and data processing operations of Petro-Chem Computing, Inc., a wholly-owned subsidiary of Duquesne Natural Gas Co. of Houston. The terms of the agreement call for the issuance of an undisclosed amount of stock to Duquesne Natural Gas Co.

Tab Products Co. of Palo Alto, Calif. has sold its Data Input Center division to United Financial Data Centers, Inc., of Detroit, Mich. Tab will receive \$402,000 in cash and notes for the assets of the division. Tab is a designer and marketer of products used in the data processing field to process and store information. United Financial is a four-year-old data processing concern which specializes in professional management assistance.

Computest Corp. of Cherry Hill, N.J., has agreed in principle to acquire Three Sigma, Inc. Three Sigma is a Phoenix, Ariz. manufacturer of disk memory test equipment for the computer industry. Under terms of the agreement, Computest will purchase 80% of Three Sigma common stock in exchange for 2,800 shares of Computest common stock.

Scientific Resources Corp., has sold its 99% stock interest in West Jersey Title and Guaranty Co., Camden, N.J. to Central Mortgage Co. The purchase price was not disclosed.

ITS Computing, Inc., of Dallas, has merged with BSM Data Processing, Inc., an Atlanta, Ga. based firm, on an exchange of stock basis. ITS will continue operating as a separate entity.

EQUIPMENT WANTED

by COMPUTER MULTIPLE LISTING SERVICE (CMLS)

CMLS Member Brokers have customers who need

Listing #	Item	When	Terms
LI501	IBM 360-50 System (512K)	September	Lease
LI508	IBM 360-30 System (65K)	July	Lease
XI510	IBM 2540-1, 1403-N1, 2821-1	Immediately	Buy or Lease

Can you supply any of this equipment?

For detailed specifications, please contact the CMLS Member Broker nearest you, or call or write

CMLS COMPUTER MULTIPLE LISTING SERVICE
1375 Peachtree St., N.E., Atlanta, Ga. 30309 (404) 892-2750

ATTENTION DATA PROCESSING REPRESENTATIVES!!

- 1 - ARE YOU INTERESTED IN MARKETING HIGHLY CONSUMABLE PRODUCTS TO D.P. ENVIRONMENT WHICH AFFORDS GREAT REPEAT BUSINESS POTENTIAL?
- 2 - ARE YOU INTERESTED IN A RAPID AND GENEROUS COMMISSION COLLECTION PLAN?
- 3 - ARE YOU IN BUSINESS AT LEAST TWO YEARS?
- 4 - ASSUMING GOOD PRODUCTS, CAN YOU GUARANTEE A QUOTA FOR EXCLUSIVE TERRITORY?

IF YOU ANSWERED YES TO EACH OF THE ABOVE — PLEASE CALL OR WRITE

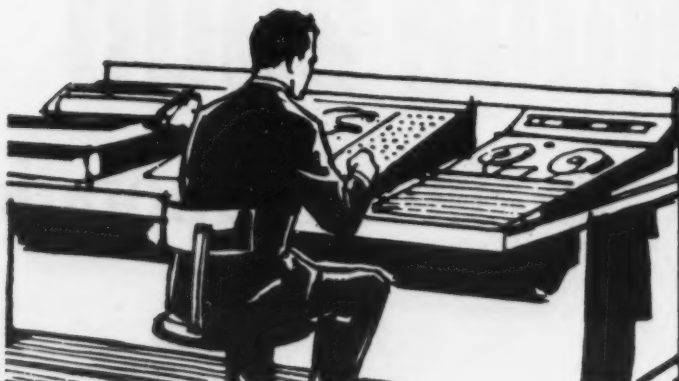
D.P. SYSTEMS, INC.

342 Madison Avenue New York, New York 10017
ATT: HERBERT F. GREINER, VICE-PRESIDENT
(212) 687-2090

Computer Services You Can Count On

To offer a full spectrum of computer services, it takes management and technical know-how. RCA Service Company has both... backed by more than 15 years' experience in programming, maintaining and operating data systems manufactured by the leading hardware firms. Look to RCA as a single source of comprehensive computer services for scientific and business applications.

Find out about computer services you can count on. The coupon will bring you full details with no obligation.



RCA

RCA Service Company F-1431
A Division of RCA
Attn: J. A. Basile
Bldg. 206-2
Camden, N.J. 08101
Please send details on RCA's computer services to:
Name _____ Title _____
Company _____
Address _____
City _____ State _____ Zip Code _____
Telephone: _____

I.B.M. USERS WEEKEND SPECIAL RATES THREE LARGE SYSTEMS GUARANTEED BLOCK TIME

(1) \$45.00 PER HOUR

360/30 65K

6 TAPES 4 - 2311's

(2) \$55.00 PER HOUR

360/40 131K

6 TAPES 5 - 2311's

(3) \$65.00 PER HOUR

360/40 131K

6 TAPES

7 and 9 TRACK

800 OR 1600 B.P.I.

2314 (8 MOD)

1401/1410/7010

D.O.S./CS/30 CS/40

FOR IMMEDIATE

GUARANTEED

SCHEDULING CALL:

DATANAMICS

624 SOUTH MICHIGAN AVE.
CHICAGO, ILLINOIS 60605
(312) 939-1323

24 HOURS PER DAY

June 17, 1970

Page 35



The control room of the Master Computer Control Center is designed to meet the rapidly expanding communications needs of the investment and brokerage industry.

On-Line Retrieval System Quotes Market Prices

MOUNT LAUREL, N.J. — An advanced information retrieval system capable of communicating simultaneously with an international market quotation network and a broker's own computer system designed by the Ultronic Systems subsidiary of Sylvania Electric Products, Inc. has gone on-line.

The system, designated Ultronic Videomaster II, also can be programmed to enter buy and sell orders and confirmations. Printers for hard copy readouts of data shown on the unit's video screen are available with the system. The Videomaster II terminal was demonstrated here at the dedication of a new Master Computer Center which controls Ultronic's international stock and commodity quotation network.

Interfaces with Computer

The display monitor is a 12-in., video screen desk-top unit that can be configured to show six lines of 40 characters; 12 lines of 40 characters, or 12 lines of 80 characters. Two keyboard configurations, typewriter or block are available.

Videomaster II is capable of interfacing directly with the customer's computer interface unit or with a data set tied to the customer's communication system.

The unit displays up to 17 pertinent facts on more than 9,500 securities. It also provides up-to-the-minute displays on such items as exchange volume; issues up, off, or unchanged; Dow Jones averages, and the S&P indexes. Included in the Videomaster II is a "marketminder" mode which displays up to 18 securities with last sales prices shown for constant surveillance. It also features a "limitminder" mode which allows an operator to preset price limits to any series of 18 securities.

Xerox Unit Drops Plans For Plant, Lays Off 350

EL SEGUNDO, Calif. — The layoff wave has crashed over Xerox Data Systems. The mainframe manufacturer has discharged 350 employees, bringing its total employment to 5,150, the same number as last October.

The Xerox subsidiary has also cancelled plans to build a \$35 million plant in Culver City, Calif. A spokesman said that the facility was dropped because of the slow economy and its effect on computer sales.

The Xerox Corp. has said previously that it expects the economic downturn to flatten its computer revenue this year.

About 170 of the 350 employees discharged were involved in manufacturing, 10% were salaried, and 180 were from other operations, including engineering, development, training, and programming. About 40% of the larger group were salaried.

An XDS spokesman said that the firm didn't expect any further "companywide" layoffs this year, "although there may be minor reductions in some areas."

The layoffs will take place within the next two weeks. XDS said that all of the 350 have been notified, and that the company is helping them find new jobs.

XDS plans to sell the Culver City property it bought earlier this year for its new headquarters. The plans had called for a million-sq-ft facility to be built in three stages. The Hughes Tool Co., Aircraft Division, had fought the new plant, saying that the proposed new building would block the flight path to its private airport.

According to XDS, however, "The opposition by Hughes had no effect whatever on the decision."

Boards OK Systems Engineering Deal for Computer Peripherals

FORT LAUDERDALE, Fla. — Systems Engineering Laboratories Inc. and Computer Peripherals of San Diego have announced that the boards of directors for both corporations have approved a formal agreement whereby Systems will acquire Computer Peripherals.

Systems is a manufacturer of real-time digital computers, custom systems, and keyboard data entry systems. Computer Peripherals is a manufacturer of head-per-track disk units.

Over the past two years, Computer Peripherals has developed and recently began manufacture of these fixed head disk drives which are used as peripheral equipment in digital computer systems.

Systems will integrate the disks into its product line and also market the products on an OEM

basis to other computer companies.

Spectral Merger On

Systems has also resolved the "hang-up" that had cast doubt on its merger with Spectral Dynamics, also of San Diego. The merger will be completed June 26.

Spectral management said that a sufficient number of shareholders had withdrawn dissenting shares to lower the total under 5%. According to the merger agreement, if more than 5% of the shares were voted against the merger, Systems would have the option of cancelling the agreement.

Holders of about 9% of the shares originally expressed dislike for the acquisition.

122,000 Shares

Systems will acquire Computer

Peripherals for approximately 122,000 shares of its common stock. If the market value of the 122,000 shares in August or Sept., 1971, is not at least \$5,500,000, subject to certain conditions, Systems would issue up to an additional 61,000 shares.

The agreement requires approval by shareholders representing two-thirds of Computer Peripherals' common stock and the satisfaction of conditions set out in the agreement.

A special meeting of Computer Peripherals' stockholders is scheduled for June 15 in San Diego to approve the agreement.

The acquisition of Spectral will cost Systems about 253,000 of its common shares. Under the agreement Spectral shareholders will receive five-eighths of a share of Systems for each Spectral share.

This means that Systems would issue about 253,000 of its shares for Spectral.

Systems was recently traded at \$17. The dollar value, then, of the Spectral acquisition is about \$4.3 million, while the Peripherals merger would cost between \$2 million and \$3.1 million right now.

The terms of the agreement indicate that Systems management expects the price of its stock to double by the fall of 1971.

Informatics Reports Loss Of \$241,000, Write-Down

SHERMAN OAKS, Calif. — Despite a fourth quarter profit before taxes and special items, Informatics, Inc. has reported year-end figures that show a small turn into the red from last year's profit, and a \$4 million write-down that puts the company firmly on the money-losing side.

Dr. Walter F. Bauer, president of Informatics, stated that the company decided to make certain balance sheet adjustments this year so that assets would be conservatively stated. "This will assure that future periods will not be burdened with write-offs or amortization of these items," he explained.

"Through the years we have been conservative in our treatment of product development costs and we have not capitalized these costs extensively. Our decision on the other adjustments made is consistent with that point of view," he said.

Revenues for 1970 totalled \$19,070,000, up from 1969's \$11,548,000. The 1969 operat-

ing profit of \$526,000 turned into a \$241,000 loss, however, and this was topped by a \$4 million write-down of Informatics' investment in two California data centers, Dataplan and Atar Computer Systems. The total 1970 loss was \$4,243,000, while 1969 brought a net profit of \$561,000, or 45 cents a share.

MDS 9-Month Earnings Hit High of \$6.4 Million

NEW YORK — V.E. Johnson, chairman and chief executive officer of Mohawk Data Sciences Corp., has announced that total revenues and earnings of the data processing equipment manufacturing and marketing concern rose to all-time highs in the nine months ended April 30, 1970.

"The results were achieved," Johnson said, "during a period of weakness in both the domestic economy and the EDP market, and were due largely to the

continued expansion of the company's rental machine population, with nine-month rental revenues up approximately 80%.

"Though less than six years old, MDS is fortunate in having developed extensive foreign operations in rapidly growing markets abroad which have helped to maintain its growth momentum during this period.

"Nevertheless," he concluded, "the slowing of deliveries by major computer manufacturers in the U.S. as a result of current economic uncertainty also forces us to be cautious about the near term outlook."

For the quarter ending April 30, Mohawk registered total revenues of \$26.4 million and net income of \$2.3 million, compared to \$23.8 million and \$2.2 million in 1969. Earnings per share for the 1970 quarter were 42 cents, while for 1970 the figure was 41 cents including a two-cent extraordinary item.

For the nine months total revenue was \$77.2 million while the 1969 figure was \$59.6 million, and 1970 earnings were \$6.4 million, up from \$4.75 million. Net earnings per share rose from 87 cents to \$1.17.

Burroughs Cuts Expenditures 15%, Cites Defense Contract Reductions

DETROIT — "Cutbacks in defense contracts" have caused Burroughs Corp. to pare its 1970 capital expenditures to \$85 million from its planned amount of about \$100 million.

A Burroughs spokesman said that the 15% cut in planned expenditures resulted primarily from the "freeing of production facilities at our defense and space group" at Paoli, Pa.

He noted, however, that the capital budget calling for an investment of \$250 million be-

tween 1970 and 1974 has not been reduced.

Burroughs President Ray W. MacDonald said at the March 25 annual meeting that Burroughs' capital outlays for 1970 would total \$100 million.

Burroughs' first quarter figures released last April showed a 28% increase in earnings and a 16% increase in revenues over the year-earlier period. Net earnings for the quarter were \$9,708,000 and revenues were \$189,175,000. Earnings per share were 56 cents.

Cut out of the best articles again, Charlie?

Get the whole story. Subscribe.

The best way not to be last on your Computerworld office routing list is not to be on it at all. And get your own personal copy delivered to you each week. So you can get to read *all* the computer news as it happens. Not when it happens to get to you.

We've developed Computerworld to be the fastest, most informative news vehicle in the entire computer field. In fact, we're the only newsweekly in our field. That's why our readers pay us to keep them up to date with the latest industry news, financial news... but you know a lot about us already. After all, you're reading Computerworld right now.

If this isn't your own personal copy of Computerworld, spring for the 17.3¢ we charge per issue. It'll save you from being last to get the left-overs.



COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

600 AUSTIN STREET, NEWTON, MASSACHUSETTS 02160 • TELEPHONE (617) 552-9400

Yes, please send me COMPUTERWORLD for...

Add \$1.00 per year for Canada; \$4.50 for Foreign

☐ 1 Year \$ 9.00

☐ 3 Years \$20.00 ☐ Bill Me

☐ Payment Enclosed

Name	31	48
Your Title	49	56
Co. Name	57	78
Address	15	37
City	38	51 52 53 2 3 STATE
Zip Code	4	8 7 6 7 5 1 5 1 6 1 7 1 8 1 9 2 0 2 1 2 2 3 2 4 2 5 2 6 2 7

Return to:
COMPUTERWORLD 60 Austin Street, Newton, Mass. 02160

Please Circle 1 Number
and 1 Letter:

YOUR TITLE AND/OR FUNCTION?

- A. Operational Management (nonengineering)
- B. Computer Professional Staff
- C. Corporate Officers
- D. Engineering Management
- E. Engineering/Scientific
- F. Production/Maintenance
- G. Sales/Marketing
- H. Other _____

COMPANY BUSINESS:

- 1. Mining or Construction
- 2. Manufacturer/Computer or Data System
- 3. Manufacturer/Other
- 4. Utility
- 5. Wholesale/Retail
- 6. Finance
- 7. Consultants/DP Services
- 8. Business Service (except DP)
- 9. Educational/Medical/Legal
- 10. Government/Military
- 11. Other _____

DiComes on Stocks

Knowledgeable \$ Come Back to Stock Battleground

With a Dow Jones Average that gave back only five and a half points for the week ending June 5, the past gains of the past weeks seem more secure.

I am not over confident that a wave of profit-taking and new scare-selling may not come about, but I feel that some of the knowledgeable money has returned to the common stock battleground and may be here to stay.

Certainly, the investors that stood on the sidelines and held cash while the bears had a field day are now back, buying the

bargains and holding them.

Among the computer stocks, Burroughs and Planning Re-

Educated at Harvard, Robert DiComes is a retired broker who spends his time managing his stock and real estate portfolios, and a farm in New Hampshire.

search look like very strong buys at the moment. And the change for speculative gains in the depressed lower-priced issues is amazing. Why not Levin-Townsend for a toy or a day at the races! Just as management

has gambled, why not we?

Foxboro is waiting for takers. At as low a price/earnings ratio as possible, this stock must be included in any computer stock portfolio.

Continuing with our evaluations commenced last week on listed issues summarized weekly in CW's Stock Trading Summary, let us look at the leasing companies, and peripherals and subsystems groups this week.

Once again, each stock listed below has either been mentioned in this column or will be spotlighted in the near future. For the sake of brevity, only three recommendations will be used: Buy, Hold, or Sell/Avoid.

Future columns will explain more fully our evaluations of each security.

Stock Judgments

Again, as I said last week, my judgments on the above stocks are done from two points of view - basic quality and good product mix or adaptability in today's market; and public (stockholders) acceptance of the company and its ability to act well as an equity trade in the current market.

All companies belong relative to their worth so far as investors are concerned. Were this not the case, then couldn't we all buy 10 shares each of every stock in the computer field and, 10 years later, pat ourselves on the back for the good ones that rose with Dow Jones Averages (and forget selectively those which may fall by the wayside)? Considering

the market, unfortunately, can never be as moot a situation as judging computers and programmers!

Now I face the reality of checking the values of my \$10,000 portfolio. I bought

when I did because I believed the market had oversold itself. That world events and business changes make me wrong will be no source of apology for me.

Let's see how badly we are doing today!

Shares	Security	Price and Value 6/5	
10	Burroughs	\$116.38	\$1163.80
15	Digital Equip.	68.00	1020.00
50	Foxboro	25.25	1262.50
50	Potter Inst.	26.50	1325.00
50	Telex (10)	14.88	744.00
50	Wang	25.50	1275.00
			\$6790.30
			67+%

LEASING COMPANIES

Exchange	Security	Close 6/5/70	Rating
N	Data Proc. F & G	12.00	Sell/Avoid
A	Dearborn Computer	13.25	Hold
A	DPA, Inc.	5.38	Hold
A	Granite Mgt.	12.00	Sell/Avoid
A	Greyhound Computer	7.50	Sell/Avoid
N	Leasco Data Proc.	11.13	Sell/Avoid
A	Levin-Townsend Cmp.	6.63	Buy (Now)
A	U.S. Leasing	12.50	Hold

PERIPHERALS AND SUBSYSTEMS

N	Addressograph-Multi.	28.00	Buy (Now)
N	Ampex	17.75	Hold
A	Astrodata	8.00	Hold
N	Bunker-Ramo	8.13	Buy
A	Calcomp	18.50	Buy
N	Electronic M. & M.	15.75	Buy
N	Mohawk Data Sci.	33.75	Buy
N	Sanders Associates	12.13	Hold
N	Telex	14.88	Buy (Now)

N=NYSE
A=ASE

DiComes' Portfolio Evaluation

Earnings Reports

WALLACE BUSINESS FORMS

Three months Ended April 30

	1970	1969
Shr Ernd	\$60	\$53
Revenue	7,785,000	7,180,000
Earnings	529,000	471,000
9 Mo Shr	1.60	1.44
Revenue	23,316,000	21,235,000
Earnings	1,424,000	1,278,000

CLARY CORP.

Three Months Ended March 31

	1970	1969
Revenue	\$2,038,000	\$2,197,000
Loss	227,000	46,000

DATA AUTOMATION CO.

Year Ended Jan. 31

	1970	1969
Shr Ernd	\$40	\$21
Revenue	7,062,098	3,540,182
Spec Cred	b35,284
Earnings	535,121	c305,041

a-Based on income before special credit. b-From sale of certain operations. c-Equal to 24 cents a share.

MOHAWK DATA SCIENCES

Three Months Ended April 30

	1970	1969
Shr Ernd	\$42	\$41
Revenue	c26,380,000	23,845,000
Earnings	2,315,000	2,230,000
9 Mo Shr	b1.17	a.87
Revenue	c77,215,000	59,575,000
Earnings	6,400,000	4,745,000

a-Includes tax credits of 2 cents a share in the quarter and 7 cents a share in the nine months. b-Includes gain on revaluation of foreign currencies of 5 cents a share. c-Includes \$1 million in the quarter and \$3 million in the nine months, from the sale of rental equipment to a third party concern.

INFOTEC INC.

Year Ended Dec. 31

	1969	1968
Revenue	\$374,679	\$310,766
Spec Cred	41,638	3,077
Loss	971,931	134,622

ADDRESSOGRAPH-MULTIGRAPH

Three Months Ended April 30

	1970	1969
Shr Ernd	\$46	\$91
Revenue	109,088,000	108,656,000
Earnings	3,669,000	7,303,000

9 Mo Shr	1.39	1.94
Revenue	307,705,000	299,033,000
Earnings	11,133,000	15,550,000

NAT'L TERMINALS CORP.

Year Ended March 28

	1970	1969
Shr Ernd	\$64	\$5.97
Revenue	8,255,000	10,420,000
Spec Cred	b109,520
Earnings	114,926	c282,654

a-Based on income before special credits. b-From the sale of assets. c-Equal to \$1.59 a share.

New Registrations

BEEHIVE MEDICAL ELECTRONICS, INC., 1473 South 6th West, Salt Lake City, Utah, a company engaged in designing, manufacturing, and selling various types of equipment used in supplying information to computers and retrieving and displaying information from computers, filed to register 200,000 shares of common stock. Proceeds, at \$12 per share, intended to be used to pay a Small Business Administration loan, to purchase equipment and machinery, to increase shelf inventory of component parts used in its medical systems and commercial computer display terminals and to increase technical personnel; the balance will be added to the company's working capital and used for general corporate purposes. The underwriter is D.H. Blair Securities Corp., 66 Beaver St., New York, N.Y.

DIGITAL COMPUTER CONTROLS, INC., 23 Just Road, Fairfield, N.J., a company engaged in providing computer engineering services to companies which design computer systems, filed to register 200,000 shares of common stock.

Proceeds at \$15 per share maximum, intended to be used to purchase inventory, to be used for capital equipment, tooling, and production equipment to commercially produce its D 112 computer, to provide for branching sales offices and hiring additional sales personnel, to research and develop new products, and to provide initial manufacturing expenses related to new products; the balance will be used to provide corporate purposes and working capital. The underwriter is D.H. Blair Securities Corp., 66 Beaver St., New York, N.Y.

DATASCAN, INC., 1111 Paulson Ave., Clifton, N.J., a company engaged in the design, manufacture and sale of electronic equipment, including control systems, integrated circuit logic cards and digital panelmeters, filed to register 200,000 shares of common stock. Proceeds, at \$25 per share maximum, intended for retiring short-term bank borrowings and the balance for general corporate purposes. The underwriter is New York Securities Co., One Whitehall St., New York, N.Y.

Position Announcements

FIELD SUPPORT ENGINEERS
Display Terminals

We are building a staff of support engineers with display experience for our growing line of computer terminals.

- to assist in customer installation planning
- to install display terminals in the field
- to provide emergency field support
- to evaluate equipment performance

Boston based - travel throughout the United States
Contact Ralph Richwagen



Hayes Memorial Drive
Marlboro, Mass. 01752 (617) 481-2000

NCR 315 NEAT
EXPERIENCED
PROGRAMMER

Magnetic tape and banking experience preferred. Relocate in Palm Beach County, Fla. Salary and relocation costs open.

American Bancservice Corp.
P.O. Box 1128
Lake Worth, Fla. 33460
(305) 582-3312

STRONG
TECHNICAL BACKGROUND
ABSOLUTELY NECESSARY

No nonsense software salesman with strong technical training and sales experience to work in Los Angeles or San Francisco Bay Area.

Mail Resumes to
CW Box 3206
60 Austin Street
Newton, Mass. 02160

SENIOR
SYSTEMS ENGINEER

Remote Data Processing Services

Our new and progressive company in Northern California, specializing in Remote Data Processing Services, is seeking a Senior Systems Engineer.

Position requires three to five years' systems experience, and at least one years' experience with Burroughs ALGOL programming.

We offer an excellent salary plus an outstanding benefits program. Send resume, including salary history and requirements to CW Box 3209, 60 Austin St., Newton, Mass. 02160

an equal opportunity employer

IBM 360 MODEL 50H AVAILABLE FOR LEASE

1st Sel. Channel
2nd Sel. Channel
1052 ADAPTER
Can deliver within 90 days
Principals Only
Please call collect:
John Puttre
(914)428-5000

360/30 360/40 1401 1440 729's
ALL 360 COMPONENTS
360/50

WANTED TO BUY

as principals

CORPORATE COMPUTERS, INC.

120 E. 23 St., N.Y., N.Y. 10010 (212) 867-0664, ext. 202

Available within 90 days
360/20 SYSTEM
For sale or lease

CNA/Insurance offers:

Attractive financing terms for purchaser Generous discount rates for lessee

Available Nov. 1, 1970, or as close as 90 days from date of agreement, this IBM 360/20 System can be purchased or leased from CNA/insurance.

SYSTEM INCLUDES

Machine	Model or Feature	Description
2020	BC2 4448 4460 4658 7495 8090 8637	Processing Unit Card Print Control 1442 Mod 5 Adapter Input/Output Channel Storage Control 2501 Attachment Universal Character Set Adapter
	#S50027	STR Communications Adapter
2501	A2	Card Reader
2415	1	Magnetic Tape Unit and Control
1442	5	Card Read Punch
1403	N1 8640	Printer U C S
1416	1 9643	Print Train RN3 Arrangement

For further information contact:

William D. Salava
CNA/insurance
310 S. Michigan Ave.
Chicago, Ill. 60604
(312) 822-5044

Earnings Report

IMAGE SYSTEMS INC.

Year Ended Dec. 28

	1969	1968
Revenue	\$4,267,740
Loss	3,271,389

The report said the above figures represent the company's first full year of operations. No comparable figures available.

COMPUTER APPLICATIONS INC.

Six Months Ended Mar. 31

	1970	a1969
Revenue	\$20,087,000	\$21,402,000
Spec Chg	b4,208,000
Loss	9,806,000	1,648,000

a-Restated by company. b-Consists of a gain on sale of 18% of common

stock of EBS Data Processing Inc. of \$3,282,000, a write-off of deferred speed etc., development costs of \$6,368,000, and a provision for loss on discontinued operations of \$1,122,000.

PROGRAMMING SCIENCES CORP.

Three Months Ended Feb. 28

	1970	c1969
aShr ERnd	\$0.01	...
Revenue	809,586	\$576,523
Tax Cred	5,210	1,174
Earnings	b23,681	5,337

a-Based on income before tax credit, and on shares adjusted to reflect two-for-one stock split declared Feb. 20, 1970. b-Equal to one cent a share. c-Restated by company to reflect current accounting practices.

CONTROL DATA CORP.

Three Months Ended Mar. 31

	1970	1969
Shr Ernd	\$0.09	\$1.13
Revenue	80,929,000	90,852,000
Earnings	1,281,000	16,572,000

This report is subject to year-end audit.

BASIC INC.

Three Months Ended

	1970	1969
aShr ERnd	\$0.38	\$0.34
Revenue	12,581,127	10,832,134
Earnings	554,610	499,606

a-Based on 1,294,450 shares, the average number outstanding for both quarters.

COMPUTER EQUIPMENT CORP.

Three Months Ended Mar. 31

	1970	a1969
Shr Ernd	\$0.06	\$0.06
Revenue	5,613,000	4,742,000
Earnings	140,000	138,000

a-Restated to include acquisition on a pooling-of-interests basis.

CALIF. COMPUTER PROD.

Nine Months Ended Mar. 29

	1970	1969
Shr Ernd	\$0.20	\$0.31
Revenue	16,475,496	14,010,930
Earnings	459,947	688,914

BRANDON APPLIED SYSTEMS

Year Ended Feb. 28

	1970	g1969
Shr Ernd	a\$0.10
Revenue	\$4,703,456	\$3,010,619
Spec Chg	d100,478	e18,506
Loss	996,602	f108,707

a-On a fully diluted basis, and based on income before special items. d-Consisting of a loss from terminated acquisition and joint venture less a tax-loss carry-forward credit. e-Credit; from tax-loss carry-forward. f-Income; equal to 12 cents a share. g-Restated to reflect pooling-of-interests.

DATA DESIGN LABORATORIES

Nine Months Ended March 31

	1970	a1969
Shr Ernd	\$0.22	\$0.18
Revenue	5,516,370	3,522,941
Earnings	230,198	186,004

a-Restated for acquisition on a pooling-of-interests basis.

GERBER PRODUCTS CO.

Year Ended March 31

	1970	1969
Shr Ernd	\$1.87	\$1.74
Revenue	217,170,694	202,179,382
Earnings	15,502,468	14,498,630
3 Mo Shr	.46	.44
Revenue	54,978,475	52,077,401
Earnings	3,802,181	3,636,751

TOPAS COMPUTER CORP.

Year Ended Dec. 31

	1969	a1968
Shr Ernd	\$0.14	\$0.08
Revenue	2,899,040	2,001,404
Earnings	107,970	50,393

a-Includes Fleet Leasing Inc., acquired in March 1969, on a pooling-of-interests basis.

HEWLETT-PACKARD CO.

Three Months Ended April 30

	1970	1969
Shr Ernd	\$0.24	a\$0.25
Revenue	91,698,000	80,413,000
Earnings	6,148,000	6,346,000
6 Mo Shr	.46	a.46
Revenue	174,068,000	151,959,000
Earnings	11,704,000	11,688,000

a-Adjusted to reflect two-for-one stock split in February 1970.

COMPUTER ROOM FLOOR

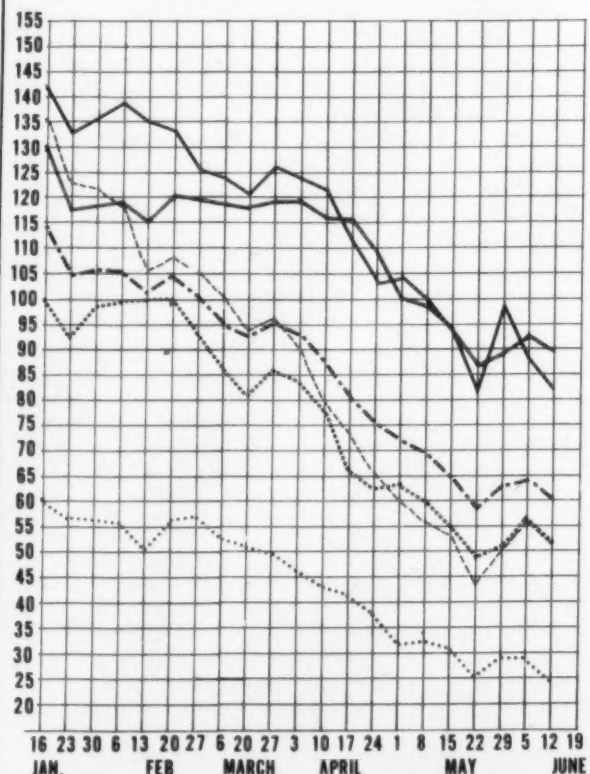
Approximately 1,000 square feet of Besco Elevated Flooring system available.

The substructure is full grid bolted frame type, 24 in. x 24 in. panels are steel clad, resin fiber core covered with GE Perma Kleen 4851 high pressure laminate, floresque beige with brown trim. Half of the panels are new; the other half were in use only two months and has the appearance of being new.

Call: J.R. Moul, (214) 369-8231 for additional information.

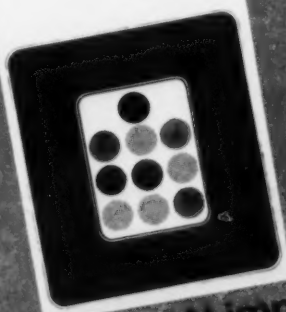
Computer Stocks Trading Index

— Computer Systems - - - - Software & EDP Services
- - - - Peripherals & Subsystems - - - - Leasing Companies
- - - - Supplies & Accessories - - - - CW Composite Index



BASE FOR EACH TRADING INDEX: 100 as of 3/1/68

HOW TO GET THE MOST OUT OF
YOUR COMPUTER STAFF
PROVEN APPROACHES
AND ACTUAL RESULTS



**you CAN improve
your computer staff!**

This 20-page illustrated report shows how to design and install a first rate employee development plan. It outlines the practical steps you can take to train your operators, programmers, analysts, and managers. It includes an analysis of the successful experiences of over 15 systems organizations and the contributions we are making to their success.

Get your personal copy of this comprehensive report and \$2.50 to: **ADVANCED MANAGEMENT SCIENCES**, 11111 Wilshire Blvd., Suite 1000, Los Angeles, CA 90024

Computerworld Stock Trading Summary

NEW YORK AND AMERICAN STOCK EXCHANGE CLOSING PRICES, FRIDAY, JUNE 12;
OVER THE COUNTER AND NATIONAL STOCK EXCHANGE, THURSDAY, JUNE 11

SUPPLIES & ACCESSORIES

EXCH	1970 RANGE	CLOSING PRICE		WEEK NET CHANGE	WEEK PERCENT CHANGE
N	15- 8	10	ADAMS-MILLIS CORP	---	----
O	21- 12	12	BALTIMORE BUS FORM	- 1/2	- 4.00
A	25- 7	9 1/2	BARRY WRIGHT	- 1/8	- 1.30
A	35- 17	18 3/4	DATA DOCUMENTS	- 1 3/4	- 8.54
N	19- 12	14 3/4	ENNIS BUS. FORMS	+ 1/8	+ 0.85
O	17- 8	9 1/4	GRAPHIC CONTROLSCORP	1/4	- 2.63
N	166- 63	78	MEMOREX	- 1	- 1.27
N	114- 77	80 1/2	3M COMPANY	- 4 7/8	- 5.71
O	38- 29	29 7/8	MOORE BUS FORMS	- 7/8	- 2.85
N	43- 21	26 1/4	NASHUA CORP.	- 1/2	- 1.87
O	48- 30	34	REYNOLDS & REYNOLD	- 1	- 2.86
O	30- 20	21	STANDARD REGISTER	- 1	- 4.55
N	39- 24	24 3/4	UARCO	- 1 3/4	- 6.60
A	30- 8	10 1/2	WABASH MAGNETICS	- 7/8	- 7.69
O	41- 25	30	WALLACE BUS FORMS	- 2	- 6.25

PERIPHERALS & SUBSYSTEMS

EXCH	1970 RANGE	CLOSING PRICE		WEEK NET CHANGE	WEEK PERCENT CHANGE
N	62- 24	26	ADDRESSOGRAPH-MULT	- 2	- 7.14
O	15- 2	1 1/8	ALPHANUMERIC	---	---
N	48- 13	18 1/2	AMPEX CORP	+ 3/4	+ 4.23
A	34- 5	7	ASTRODATA	- 1	- 12.50
O	11- 3	6 3/4	BOLT, BERANEK & NEW	- 3/4	- 10.00
N	14- 6	8	BUNKER-RAMO	- 1/8	- 1.54
A	33- 13	17 1/2	CALCOMP	- 1	- 5.41
O	13- 4	6	COGNITRONICS	- 1/4	- 4.00
O	12- 5	6	COLORADO INST.	+ 1/4	+ 4.35
O	36- 8	11 1/2	COMPUTER COMMUN.	- 1	- 8.00
A	12- 3	4 7/8	COMPUTER EQUIPMENT	- 1/4	- 4.88
A	28- 13	17 1/2	COMPUSET	---	---
A	35- 7	9 1/2	DATA PRODUCTS CORP	- 5/8	- 6.17
O	23- 6	8	DATA TECHNOLOGY	- 3 1/2	- 30.43
O	13- 5	6 1/4	DIGITRONICS	---	---
N	40- 10	14 3/8	ELECTRONIC M & M	- 1 3/8	- 8.73
O	8- 3	4 7/8	FABRI-TEK	---	---
O	17- 2	3 3/4	FARRINGTON MFG	- 7/8	- 18.92
O	20- 6	7 1/2	INFORMATION DIS	- 3/4	- 9.09
A	67- 17	22 1/2	MARSHALL INDUSTRIES	+ 3/4	+ 3.45
A	84- 15	21 1/8	MILGO ELECTRONICS	+ 3/4	+ 3.68
N	87- 27	30 1/2	MOHAWK DATA SCI.	- 3 1/4	- 9.63
O	52- 16	21 1/2	OPTICAL SCANNING	- 1 1/2	- 6.52
O	17- 4	5 3/8	PHOTON	- 5/8	- 10.42
O	4- 1	1 3/4	PHOTO-MAGNETIC SYS.	---	---
A	42- 23	25 3/4	POTTER INSTRUMENT	- 3/4	- 2.83
O	25- 12	14 3/4	PRECISION INST.	- 3/4	- 4.84
O	83- 21	30 1/2	RECOGNITION EQUIP	- 6 1/2	- 17.57
O	34- 6	8 1/4	REDCOR CORP.	- 1/2	- 5.71
N	29- 9	10 7/8	SANDERS ASSOCIATES	- 1 3/8	- 11.22
O	53- 7	13	SCAN DATA	- 1	- 7.14
O	23- 10	12 1/2	TALLY CORP.	- 1 1/2	- 10.71
N	25- 11	14 3/8	TELEX	- 1/2	- 3.36
O	50- 8	10 1/4	VIATRON	+ 3/4	+ 7.89

COMPUTER SYSTEMS

	1970	CLOSING		WEEK	WEEK
EXCH	RANGE	PRICE		NET	PERCENT
				CHANGE	CHANGE
N	172-100	102	BURROUGHS CORP	-14 3/8	- 12.35
N	37- 14	15	COLLINS RADIO	- 2 1/4	- 13.04
N	122- 35	41 1/4	CONTROL DATA CORP	- 3/4	- 1.79
A	124- 57	69 1/2	DIGITAL EQUIPMENT	+ 1 1/2	+ 2.21
N	11- 4	5 1/4	ELECTRONIC ASSOC.	---	---
A	14- 3	4 3/4	ELECTRONIC ENGINEER	- 1/2	- 9.52
N	39- 22	23 1/4	FOXBORO	- 2	- 7.92
O	42- 12	15 1/2	GENERAL AUTOMATION	- 1	- 6.06
N	77- 60	65 7/8	GENERAL ELECTRIC	- 3/4	- 1.13
N	45- 24	25 1/2	HEWLETT-PACKARD CO	- 2 3/4	- 9.73
N	152- 73	78 5/8	HONEYWELL INC	-10 3/8	- 11.66
N	387-237	259	IBM	-11	- 4.07
N	86- 48	49 1/4	NCR	- 3 3/4	- 7.08
N	34- 20	21 1/8	RCA	- 1 1/8	- 5.06
N	33- 16	20 5/8	RAYTHEON CO	- 1 1/8	- 5.17
O	8- 2	3 7/8	SCI. CONTROL CORP.	- 3/8	- 8.82
N	40- 24	26 3/8	SPERRY RAND	+ 1/8	+ 0.48
A	49- 14	17 1/4	SYSTEMS ENG. LABS	+ 3/4	+ 4.55
N	29- 12	14 7/8	VARIAN ASSOCIATES	- 1/4	- 1.65
A	51- 21	25 1/4	WANG LABS.	- 1/4	- 0.98
N	115- 70	76 1/4	XEROX CORP	- 4 1/2	- 5.57

LEASING COMPANIES

EXCH	1970 RANGE	CLOSING PRICE		WEEK NET CHANGE	WEEK PERCENT CHANGE
O	9- 4	5 5/8	BANISTER CONTIN	- 1/8	- 2.17
O	25- 12	12 1/2	BOOTHE COMPUTER	- 1	- 7.41
O	8- 3	5	BRESNAHAN COMP.	- 1/2	- 9.09
O	8- 2	6	COMPUTER EXCHANGE	+ 2	+ 50.00
O	18- 4	---	COMPUTER LEASING	---	---
O	15- 2	---	CYBER-TRONICS	---	---
N	32- 6	12 5/8	DATA PROC. F & G	+ 5/8	+ 5.21
O	8- 3	4	DATRONIC RENTAL	- 1/4	- 5.88
A	24- 10	12 3/8	DEARBORN COMPUTER	- 7/8	- 6.60
O	8- 4	4 1/4	DIEBOLD COMP. LEAS.	- 1/4	- 5.56
A	10- 3	5	DPA, INC.	- 3/8	- 6.98
A	22- 7	11 1/4	GRANITE MGT	- 3/4	- 6.25
A	44- 5	6 5/8	GREYHOUND COMPUTER	- 7/8	- 11.67
N	30- 7	10 1/8	LEASCO DATA PROC.	- 1	- 8.99
O	5- 2	2 3/4	LECTRO COMP LEAS	- 1/4	- 8.33
A	19- 3	6 1/2	LEVIN-TOWNSEND CMP	- 1/8	- 1.89
O	3- 1	1 3/4	LMC DATA, INC.	- 1/8	- 6.67
O	4- 1	2 1/8	MANAGEMENT ASSIST	- 1/4	- 10.53
O	8- 3	4 3/8	NCC LEASING	---	---
O	8- 3	3 1/2	SYSTEM CAPITAL	---	---
A	19- 9	12 1/8	U.S. LEASING	- 3/8	- 3.00

SOFTWARE & EDP SERVICES

EXCH	1970 RANGE	CLOSING PRICE		WEEK NET CHANGE	WEEK PERCENT CHANGE
O	6- 2	2 1/4	ADVANCED COMP TECH	- 1/4	- 10.00
A	24- 4	5 3/4	APPLIED DATA RES.	+ 1/2	+ 9.52
O	18- 4	5 1/2	APPLIED LOGIC	- 1/4	- 4.35
O	8- 1	2	ARIES	---	---
A	47- 23	28 3/4	AUTOMATIC DATA PRC	- 1 5/8	- 5.35
O	14- 5	8 1/4	AUTO SCIENCES	- 1 1/4	- 13.16
O	9- 2	3 1/4	BRANDON APPL SYS	- 1	- 23.53
O	3- 1	1 3/4	COMPUTER AGE INDUS.	+ 1/4	+ 16.67
A	12- 2	3 1/4	COMPUTER APPL	- 1/8	- 3.70
O	14- 3	4 3/4	COMPUTER ENVIRON	- 1/4	- 5.00
NAT	10- 3	---	COMPUTER INDUS.	---	---
O	13- 3	3 1/4	COMPUTER NETWORK	- 1/4	- 7.14
O	15- 5	7 1/8	COMP. PROPERTY	- 1 1/8	- 13.64
N	34- 7	11 1/4	COMPUTER SCIENCES	- 1/8	- 1.10
O	8- 4	4 1/2	COMPUTER USAGE	- 7/8	- 16.28
A	75- 18	23 1/4	COMPUTING & SOFT	- 1 1/2	- 6.06
O	9- 2	3 1/8	COMPRESS	- 3/8	- 10.71
O	14- 2	3 3/4	COMSHARE	- 1/4	- 6.25
O	3- 1	1 3/4	CONSOL. ANAL. CENT.	+ 1/4	+ 16.67
O	24- 4	5 1/4	DATA AUTOMATION	- 1/2	- 8.70
O	28- 9	10	DATA PACKAGING	- 2 1/4	- 18.37
O	6- 1	2	DATAMATION SERVICE	- 1/2	- 20.00
O	9- 5	7	DATATAB	- 1/4	- 3.45
O	4- 1	2 1/2	DIGITEK	---	---
O	13- 5	8	EDP RESOURCES	- 1/4	- 3.03
A	11- 5	6 1/8	ELECT COMP PROG	- 3/4	- 10.91
O	161- 31	33	ELECTRONIC DATA SYS.	- 4	- 10.81
U	20- 4	9	INFORMATICS	+ 1 1/8	+ 14.29
A	25- 6	9 3/4	ITEL	---	---
O	13- 1	---	LEVIN-TOWNSEND SERV.	---	---
A	25- 11	13	MANAGEMENT DATA	- 1	- 7.14
O	8- 3	3	NAT COMP ANALYSTS	- 1/4	- 7.69
O	12- 3	9 1/4	NAT. COMP. SERV.	- 1/4	- 2.63
N	54- 13	17 3/8	PLANNING RESEARCH	- 1 7/8	- 9.74
O	27- 9	13	PROGRAMMING METHODS	+ 1/2	+ 4.00
O	5- 2	3	PROGRAMMING & SYS	---	---
O	33- 3	5 1/2	PROGRAMMING SCIENCES	- 1	- 15.38
N	14- 4	4 5/8	SCIENTIFIC RESOURCES	- 7/8	- 15.91
O	2- 1	1 1/8	SOFTWARE SYSTEMS	- 1/8	- 10.00
O	27- 6	8	TBS COMP CENT INC.	---	---
O	4- 2	3 1/2	UNITED DATA CENTER	- 1/8	- 3.45
N	99- 19	25 5/8	UNIVERSITY COMP.	+ 1/2	+ 1.99
A	20- 5	7	URS SYSTEMS	- 1/4	- 3.45
O	13- 3	3 1/2	U.S. TIME SHARING	---	---

Small Firm Sues IBM, Complains Of MT/SC Use

WASHINGTON, D.C. — Entering the arena of litigating giants, Computer Graphics recently became the smallest firm ever to engage IBM in antitrust action.

The 21-count complaint was filed in the U.S. District Court for the District of Columbia. While it involves the Data Processing Division of IBM to some extent, it concentrates on the Office Products Division and its MT/SC (Magnetic Tape Selectric Composer) line.

An IBM spokesman noted that on April 21, IBM sued Computer Graphics in the Circuit Court of Fairfax County, Va., for about \$74,000 of "long overdue rental and purchase payments for Office Products Division products and services." He noted that IBM's position was that "It seems that this suit is Mr. Scherer's response to the earlier suit filed against his company by IBM."

Among charges of fraud, refusal to sell, refusal to service, abuse of process, the complaint contends that IBM is marketing the MT/SC as a typewriter to bypass the 1956 consent decree. The controversy centers around the definition of an electronic data processing system, for if the MT/SC is a computer and the complaint maintains that it is a powerful and sophisticated computer, IBM has been violating and continues to violate the consent decree of 1956.

Typesetting Services

A Virginia corporation since 1968, Computer Graphics specializes in computerized typesetting services and keyboard-to-tape data entry. Together with its subsidiary, Holland Office Service, Inc., the firm employs 70 people.

"Computer Graphics has been on the verge of disaster for over one year," the suit alleges. Although properly financed in December of 1968, "IBM has refused to sell equipment to plaintiffs, even on a cash basis..."

IBM Stranglehold

As the complaint continues, "Computer Graphics has discovered and developed ways and means to lessen IBM's stranglehold on the keypunch market and equipment." To such threat, the complaint states, IBM is reacting to protect its 500,000 keypunch machines currently on the market.

In addition to money damages, the suit requests injunctive relief.

According to Helmuth Scherer, president of Computer Graphics, his firm is also litigating in state court. Scherer sued first, then IBM filed a motion for judgment demanding \$15,886 from Computer Graphics. To that motion Computer Graphics responded with a counterclaim, alleging that IBM's action was malicious, perjured, and unfounded.

"Repeated audits revealed that IBM owed monies to Computer Graphics," said Scherer, "and not the other way around. Ever since Computer Graphics opened its doors, IBM has done anything and everything to prevent us from functioning properly. Their billing procedure is atrocious."

New **Autoflow**[®] beats out its closest competitor: old Autoflow

Old Autoflow is not so old. It was introduced in 1967. It's installed in over 1,100 computer systems.

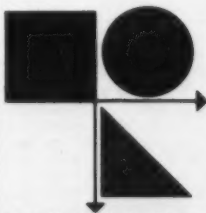
But we continually change and improve it. The first Autoflow, for instance, had one language and 5 listings. Today, 14 languages and 12 listings are incorporated.

In all, the 1970/360 system is three times more comprehensive than the original.

Right now Autoflow is at work in more computer systems than any comparable software system. By far.

For one simple reason: Autoflow does more. It flowcharts. Debugs. Documents. Cross references. Helps in desk checking and training. Saves time and money in program development, corrections, and maintenance.

If you haven't seen Autoflow in a while, call us. We'll arrange for a demonstration.



Applied Data Research, Inc.
Route 206 Center
Princeton, New Jersey 08540
609 921-8550

Offices in Atlanta, Boston, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Hartford, Houston, Kansas City, Los Angeles, Milwaukee, Minneapolis, New York, Philadelphia, Pittsburgh, Rochester, St. Louis, San Francisco, Washington, D.C. and principal foreign cities.